Telephony.

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Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

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"There is no stronger inducement to the managers of a public service corporation to serve the public well than a healthy apprehension that a rival concern will do so. It is sometimes argued that the presence of two telephone systems in a given district is a disadvantage to the community, which is best served by one system reaching all subscribers; but one system will never be made to reach all subscribers as cheaply as would otherwise be the case if the possibility of competition is destroyed."—*The Supreme Court of New York in the Yates Hotel Case, decided June 14, 1910. Opinion by Justice Willard Bartlett, Chief Justice Cullen, and Justices Haight, Hiscock and Chase concurring; Justice Gray not voting.*

Emergencies.

When all is calm and serene prepare for the storms which are sure to come. Summer is the appropriate time to make preparation for the winter. Perhaps that is the reason why we have a summer season.

Experience has taught us that some night or day during each winter a storm has wrought damage to many telephone plants. Only the larger companies are in a measure prepared for this. They carry a certain amount of material to provide for unexpected emergencies. In this way a considerable amount of capital is held inactive, deprived of its earning power it would seem. The income from this capital is problematical. If emergencies so require, the material is at hand, available at a moment's notice. Thus the period when a vastly larger amount of capital will remain inactive will be shortened to such an extent as to over-balance the loss upon that invested in emergency supplies. With the smaller companies the necessity is not less; their hazard is even greater, as they may lose a larger percentage of their working equipment, while the larger companies maintain a system with a diversity of routes.

Generally, however, the smaller companies cannot spare the capital to be tied up in emergency material. More than this, few have devoted much thought to the matter. So when the storm does come there are rush orders galore to various supply houses. It is not surprising that there is confusion and consequent delay. We believe this is unnecessary.

It is generally known that certain maintenance material will be ordered, or rather must be ordered, during the winter to be used on spring inspection, several months in advance of its actual requirements. It does not appear unreasonable to

assume that this amount cannot be estimated and delivery arranged for at such a time that it will be in the storerooms when winter sets in. This, taken together with the regular stock, will provide something to fall back upon in an emergency. The investment will be within reason, and a partial protection against the natural hazard is provided.

From another viewpoint we will find that many companies contemplate extending or rebuilding their lines during the following summer. Is it unreasonable to suggest that such definite action be taken as to have a part or all the material ordered before the winter season sets in. Isn't the hazard worth the investment and consideration? If the call comes the material will be at hand; if not, it will be ready for the purpose for which it was ordered.

"But" (there are always buts) "suppose the price of supplies should decrease?" It is but an even chance whether it will or not. Next winter, when the outside plant is prostrated and bereft of its earning power, the price of material to restore the service will be a question to receive very little consideration.

Do It Now—or Think It Over.

The weary clerk raises his eyes from the task in hand only to have them rest upon a wall motto, postal card or calendar pad that says in cheap red letters, "Do It Now!" This motto business is done to death. People send us postal cards with "Life is just one damn thing after another." Or, the supply dealers send us a monthly calendar with "If you want to know who is boss, start something." And so on, and we think it something new, until we sit down and find that old Marcus Aurelius or some Rameses said these same things two thousand years ago. Thank God for an office with nothing on the walls but some color restful to the eyes. Out of doors nature soothes us because she has no mottoes on her, unless put there by some advertising villain.

And will the "Do It Now" theory bear the test of analysis? It may be applicable to those whose work is the dreariest routine. Of course, routine shouldn't be dreary. It should be full of interest and filled with unimagined tales to be discovered only by closest application.

When it is desired to do another an injury should we "Do it Now"? Better think it over. If, in the course of business, an estimate for a large expenditure needs approval should we "Do It Now"? Better think it over. When asked for an opinion on some unfamiliar subject, shall we "Give It Now"? Better think it over. If a large engineering problem is to be solved shall we "Do It Now"? Better mull it over, cull it over, roll it over, and think it over.

In short, THINK it over, and DO it then.

A Talk to Executives

This is going to be a talk to foremen, wire chiefs, supervisors, chief operators, executives, and all others in authority. So much has been written telling the subordinate to be prompt, faithful, efficient and to work hard and long that we feel he has had his share of trouble. Every time he raises his tired eyes from his desk they rest on a red and white, cheap and nasty, ten-cent store sign that says, "Get Busy," "Do it Now," or similarly famous phrases. Let us ask those in authority—are you doing all that you should for such of those under you as are deserving? Do you know who has worked long and faithfully without recognition, either by praise or cash? Do you know who is working overtime and at actual danger to his own health because help that he had was taken away to be given to someone else? Do you say a good word for those under you, to those above you, or do you criticise your own force? Do you promote people for brains and ability, or for influence and vocabulary? Do you let your men and women holler for more money till their throats are sore, or do you freely give it when they deserve it?

Muck rakers have written much for the magazines about the Standard Oil Co., but one point they have almost always forgotten: The Standard Oil Co. pays its employes with hard cash instead of titles, and you will never find a Standard Oil Co. employe who will find fault with the company or tell anything it doesn't wish told. We once knew a young man who worked for that company in its offices, and who had to leave his employment on account of brain trouble. He retired to a country place, and was unable to work for a number of years. The Standard Oil Co. paid him half salary until he died. Does it pay? See how much Standard Oil stock you can buy for $500.

The Use of the Label.

The habit of securing orderly conditions in an exchange by the free use of labels is one to be heartily commended.

Have you ever noticed the tendency which things have to disintegrate, to go to pieces?

Some day a drop or relay is taken apart to secure a repair part for some other piece of apparatus. The unassembled pieces are pushed back on some shelf. Time goes on. People forget what was done. The parts become scattered. Finally, that which lacked only one or two pieces of being a complete working apparatus becomes so scattered that its reassembly is difficult, if not impossible. It is practically lost.

This could have been saved if at the start the pieces had been carefully wrapped up or put in a suitable receptacle by themselves with a clear label as to what they are and the parts missing. It takes but a moment and may save hours of time later and the loss of the apparatus itself.

The same applies to all new or special construction and wiring in an exchange. Usually the manufacturer of a switchboard numbers and letters all terminals of circuits and all apparatus needing designation. As a time saver, the value of this is well known. But in the regular use of the exchange, additions and changes are often made by the operating company. The man who makes the change knows and remembers what was done, and the changed conditions cause him no trouble or loss of time. But for the sake of others, and to be workmanlike, he should label every addition or change so as to make its present condition clear. He has no special claim on this knowledge. It belongs to the company for which he is working, and should be so recorded as to aid any person whom the company may see fit to place on the work.

Labels, system and order cost less than confusion and loss of time.

The Telephone in Opera and Church Service Transmission

By C. E. Fairbanks

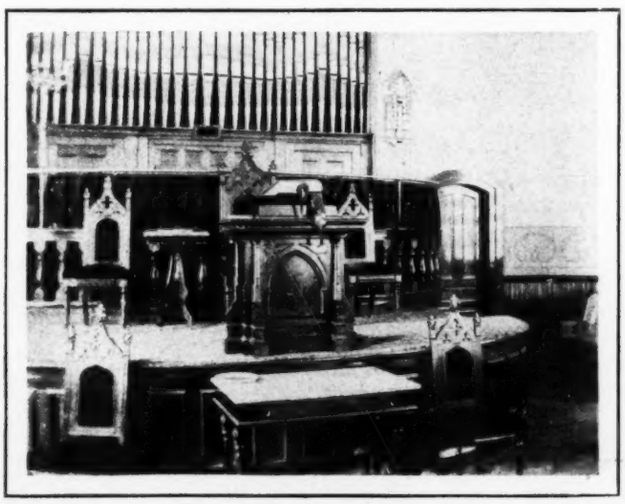
It is not of recent development that music and spoken parts have been delivered simultaneously to two audiences—one within the building and the other at some distance.

As early as June 19, 1878, at Bellinzona, Switzerland, the opera "Don Pasquale" was transmitted by telephone to an audience entirely separate from that within the theater. At about that same period, the transmission of the music from the opera in Paris to a point some distance away, is a matter of record. At Halifax, in this same year, church services were transmitted, for some months, a distance of about two miles. These early, and even more recent attempts, were only partly successful on account of the difficulty of transmitting the spoken parts. Furthermore, the acoustic properties of the building enter into the subject far more than is ordinarily suspected and a resonant effect which may be unnoticed by the ear affects the transmitter to rather considerable extent. This is also frequently the cause of even musical numbers being difficult to transmit clearly.

As the telephonic art has progressed, attempts along these lines have improved. With the advent of the solid back transmitter the nearest approach to success was reached.

Best results are obtained by removing the mouthpiece and substituting for it a "plug" with as many holes through it as may be empirically determined in each case. One method of making this "plug" is to cut off the free end of the present type of mouthpiece and fill as many of the holes in the remaining stub as may have been previously decided. The transmitter should be enclosed in felt or cotton of about ¾ in. thickness and then placed in a box which is weighted with about 3 lbs. of lead to give it stability. This box is in turn placed upon a felt pad ¾ in. thick. Of course, an opening is provided through the side of the box, somewhat larger than the exposed plug or mouthpiece.

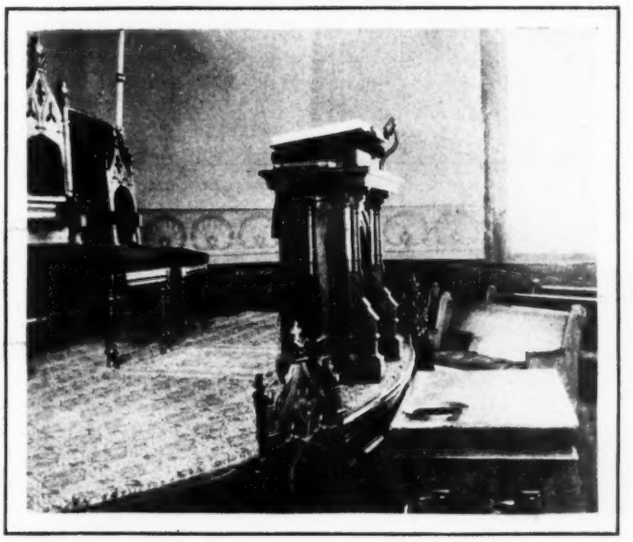
Better results are obtained if the diaphragm is of mica, so



By Use of This Pulpit Transmitter, Two Elderly People, a Mile Away, Heard the Church Services Regularly.

as to avoid the possibility of any fundamental tones inherent in a metal diaphragm. Locating an equipment of this type in the footlights of a stage has demonstrated by test that a piano recital by Paderewski, a minstrel, and any other class of either musical or spoken sounds can be transmitted distances of from 3 to 15 miles and farther without any confusion of words or music.

Church services have been particularly hard to transmit on account, usually, of the interference due to acoustic properties of the building. By making the adjustments previously out-



A Side View of the Pulpit Transmitter Arm Using the "Plug" Mouthpiece.

lined and locating the transmitter on the pulpit as shown in the illustration, no trouble has been experienced in overcoming these troubles.

Transmitters constructed with pencils of carbons and other super-sensitive types produce an effect indicating that they are entirely too sensitive for some portions of the program and also give trouble in other ways. The placing of several transmitters in series does not add to but rather interferes with the clearness of transmission. Any number of circuits may be supplied from the one transmitter by connecting in series with it and with each other, the primary windings of the induction coils.

To obtain the best results, the primary current should be maintained at .03 ampere and the source of supply should be such that the current will remain constant. Storage batteries, Edison-Lalande, or large sizes of dry battery cells, are good for this purpose. Placing several banks of dry cells in parallel is effective.

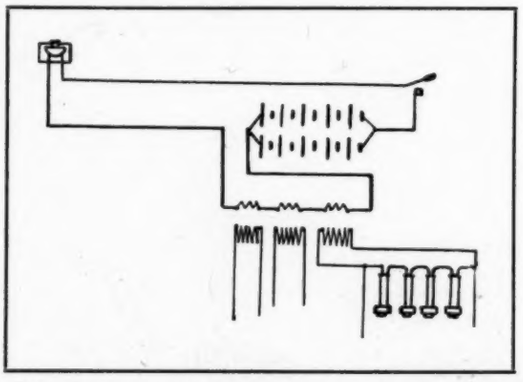
The induction coil is necessarily important; the primary winding should consist of three layers (330 turns) of No. 17 B. & S. gage wire and the secondary of four layers (1,250 turns) of No. 26 wire. The length of the core (between heads) 6 in., diameter ½ in., core consisting of the best grade of No. 26 annealed iron wire.

The standard common battery circuit is not adapted for obtaining the best results for this class of service.

In some cases it is necessary to locate the transmitter at one side of the room or building. This is never desirable and is to be avoided if at all possible. The main point is to keep the body of the transmitter from touching any hard substance and to prevent sound waves striking any portion other than the mouthpiece.

In church work one of the best methods of attaching the transmitter to the pulpit without making it conspicuous or in any way marring the woodwork, is shown in the illustration.

This consists of a support of 5/8 in. brass tubing colored to match the woodwork and attached to a plate 1/4 in. by 2 in.,



Three Circuit Arrangement for Theater Service.

which should be long enough to reach under the book rest; a screw combined with the weight of the book rest will hold it. At the top of the piece of the tubing is brazed a plate to which is attached the back of the transmitter, between the two being a 1/2 in. piece of felt. The holes for the machine screws are bushed with felt washers to prevent vibrations other than those due to sound waves being transmitted to the diaphragm.

In order to get the transmitter as near as possible to the speaker, it is sometimes necessary to suspend it from the ceiling. This can be done by using two No. 18 bare copper wires which will serve both as a means of support and for current transmission. It very frequently happens that the reverbratory effect is such as to seriously interfere with clear transmission. Repeated tests may be necessary to find a location such that this effect is negligible or a minimum.

At the receiving end, four 80-ohm receivers connected in series, constitute the maximum number which should be in series. If more receivers than this are required, they should be connected in parallel banks of four per bank. Twenty receivers, five sets in parallel of four in series per set, are the greatest number that should be connected to any one circuit. If the number of persons listening will permit, placing a receiver to each ear heightens the effect as well as increases the volume of sound received.

In this connection it may be of interest to know that at a dinner given by a prominent New York business man, the forty guests were each provided with a watch case receiver hung from the table cloth by means of a small pin hook, such as is used for supporting eye glasses. The cords were carried to the under side of the table where a running board lashed in position was equipped with the necessary terminals. The receivers were not noticed by the guests until they were requested to take them up. Music was transmitted from Philadelphia and other points, as well as a twenty-five minute speech by a prominent absentee located in Boston. In this case the forty receivers were treated as twenty, that is, in ten sets of four per set.

The church arrangement illustrated is one of several similar installations which have served for invalids or others in permitted "attendance" at all times and in all weather. Large bodies of persons located at a distance have frequently been addressed by an individual, among which may be mentioned the recent gathering of newspaper men in New York addressed by Commander Peary, Mr. Carnegie, and other prominent men in Washington. On one occasion a large number of people were entertained in this manner by a minstrel show ten miles away and another by a vaudeville entertainment twenty-five miles away.

As a single transmitter is sufficient for any number of circuits there is a large field for pleasure and profit in the transmission of concerts and services as above outlined to hospitals or private invalids, besides numerous other uses which suggest themselves.

First Employes' Annual Meeting of the Citizens Company of Pekin, Ill.

Employes and officials of the Citizens Telephone Company of Pekin, Ill., met in Peoria, Aug. 27. Members of the various departments of the exchanges in Havana, Delavan, Lacon, Green Valley, Manito, East Peoria and Pekin were present.

General Manager Geo. H. Glass read a paper touching on important subjects regarding successful management of a company, elimination of waste, loyalty of purpose, etc. Another subject discussed was the operator and her duties to employer and public. A paper on bookkeeping and accounting by Frank Weber, auditor of the company was well received. E. M. Selbert read a paper on maintenance of switchboard and care of central office. Various other telephone subjects were taken up and discussed.

After a luncheon the afternoon was spent in drawing diagrams of various parts of apparatus and equipment on a blackboard and discussing them.

One of the most interesting features of the meeting was the blackboard illustration of the organized companies by General Manager Geo. H. Glass. This illustration represented the working of a well organized corporation by shafts and wheels, a large drawing of a 130 horsepower engine, representing the 130 stockholders. The main driving shaft extended from the engine through the bank in which the 130 stockholders deposited the money to start the business. On the outside of the bank on the end of this shaft was a drawing of a large wheel on the end of the main shaft. This wheel represented the seven directors of the company. Directly under this was represented the executive shaft on which four wheels were located, to represent the president, secretary and treasurer, general manager and auditor. Directly below this were seven driving shafts, representing the seven exchanges owned by the Citizens Telephone Company. The first large wheel represented the managers with each of their subordinates. A driving belt was represented on the drawing extending to the main directors' wheel which transmitted power to the president, to the general manager, and a belt from the general manager's wheel on the executive shaft to all the managers, showing the powers and operations of organized forces.

The meeting was voted a success by all present. It was decided to have it an annual affair.

Mammoth Cave Installs Telephone Protection for Visitors.

One of the most novel telephone systems of the country was recently installed in Mammoth Cave, near Bowling Green, Ky. The cave has been undergoing a course of "reconstruction" recently, as the passages have been cleaned up and sanitary ventilation and lighting facilities have been installed. One of the innovations is a telephone line, connecting various points of the cave with the outer world, and the telephones are used as a safety device by the guides, who notify each other and the dwellers in the upper world of any rise in Echo River. This subterranean stream is liable to go on a rampage without any notice, endangering the lives of visitors.

T. N. Vail May Become President of Western Union.

Rumors from New York deal with the possibility that Theodore N. Vail, president of the American Telephone and Telegraph Company, may succeed President Robert C. Clowry as head of the Western Union Telegraph Company. It is well known that the reorganization of the Western Union company is well under way and minor appointments in the reorganization plan have already been made.

How Chicago People are Educated

Regulation vs. Competition—Weber's Weekly—A Monopoly Ridden Town.

By J. C. Kelsey

The great city called Chicago is composed principally of brokers and human beings who toil daily in sweatshop and office.

They are paid and incidentally fed, clothed, lodged and influenced by the philanthropic hand of some great public utility.

They read and believe everything handed to them, and are ever ready to lick the hand that controls them.

The people stand more abuse and have less return for their money than in any other locality.

I want you to see the kind of bunk handed out.

Something has been said of Weber's Weekly in these columns.

It carries no advertising and as far as we can learn, it has few subscriptions.

It is reasonable to assume that a voluntary defense of Chicago's public utilities is hardly probable.

Unless he is remembered at Xmas time by these utilities a voluntary defender is liable to learn that republics and corporations are very ungrateful.

Here is what a Chicago man practically reads daily and weekly:

I. "Competing franchises add to service cost."

II. "Public utility concerns should not be regulated and exposed to competing franchises."

III. "Direct regulation of charges of public utility corporations has taken the place of regulation by competition."

IV. "What is needed most at this time, with the increasing price regulation, is an accepted method—a formula—of determining what a public utility concern may charge for its service."

V. "In the capitalization of Chicago public utility corporations are included purchases of competing concerns."

No one seems to come to the support of the first contention with any particular argument.

Those of us in the telephone business think differently.

Take Kansas City for instance.

At one time the Bell company had 10,000 telephones in this live town.

It charged a maximum of $96 per station for business.

Its service was very indifferent.

Citizens of Kansas City tried regulation.

The company resisted manfully.

Of course, it would not resist now because the Chicago writer says "The policy of regulating prices has come to stay." Has it?

It resisted regulation to the last. And it won out in court.

Shortly afterward the Home company started.

It charged $60 for business service.

The other company which so vigorously resisted regulation surrendered to competition and met the new prices.

Each company now serves over 20,000 subscribers.

The duplication does not exceed 10 per cent.

This means that 4,000 people pay for two telephones.

Thirty-six thousand have but one.

Kansas City is paying an average of $66 instead of $96 for business telephones.

Surely competing franchises have not added to service cost —to the people.

The Chicago people only hear the side of the original company.

Competition may add to the cost of service.

It sounds reasonable. Why not?

It costs the Pennsylvania and New York Central more to carry passengers to New York because eighteen-hour trains have been added to the old service.

When the Michigan Central completes the Detroit tunnel it will have eighteen-hour ambitions, too.

According to the argument, the authorities should forbid such a train, because it will add to the service cost of the Pennsylvania.

The whole argument made is in the interest of the telephone company.

The city of Chicago has entered upon a policy of regulation.

This has been done in a feeble sort of a way.

After the telephone company accepted the ordinance it spoiled the beautiful plan of regulation by claiming to lose money.

Right in the face of it the automatic interests are installing competing telephones.

The old telephone company has added to its service cost in but one visible way.

It is sending around special agents to see how subscribers are getting along.

The reason why public utilities should not be regulated and exposed to competition is given thus:

"It will be impossible for public officials to regulate charges of a multiplicity of corporations so that the charges that each is allowed to make would be sufficient to compensate for the service."

"The volume of business is a most important factor in determining compensation."

"With volume of business in doubt a rate cannot be fixed."

"A company has the legal right to refuse to continue the rates made under conditions of non-competition."

This gives us an idea.

When your directors are threatened with Bell invasion, hand out such arguments.

Your council gave you certain rates.

They have no right to grant a mutual company or any other company the opportunity of competing with you.

I don't think the argument will work, but you have the Chicago idea, anyway.

Contention III that regulation has taken the place of competition is supported by the following:

"Two hundred years ago prices of all items were fixed by law."

"Wages, food, clothes, lodging, cartage and every other industry had its legal price."

"Then came the Adam Smith school of economics."

"Regulation of prices by law was abolished and competition in trade was relied upon to give the people a square deal."

"At this time the toll road was the only public utility."

"These charges were fixed by law."

"Later the toll roads were bought by the state."

"Since that time the railway, telephone, gas, electric, and other utilities have sprung into existence."

"The policy of regulation hies back to toll roads, and justifies itself, because there is no possibility of the states taking over the utilities."

The case is hardly proved, although you may find some useful argument.

We do have regulation of prices.

The Elgin butter crowd get together—meat, vegetables and everything you eat are controlled.

I am in sympathy with public utility concerns. They are hard pressed.

Your local banker can earn 500 per cent, and you think he is a Napoleon of finance.

Your telephone company earns 12 per cent and the people call you a hog.

Mr. Ripley justly said that railroads were entitled to an earning of 12 per cent.

So are you.

Still, competition is the public's only defense, and the blindest of the blind can see that the only cheap things are due to competition, or fear of it.

Regulation would be fine if a monopoly would behave. If it would expand and take care of the public's business. But it won't.

Contention IV shows the need of a formula.

That is a stunner.

It reminds me of a fable in which the mice decided it would be a good thing to put a bell on the cat.

It would be fine to have a formula for every kind of business.

It would save millions.

Ninety-five out of every hundred enterprises are either failures or disappointments.

If a formula were available, bankers, investment dealers and investors could sleep nights.

But no formula will apply to any business enterprise.

Of course, we can easily decide upon 6 per cent or 8 per cent for return upon actual investment, but the question is to get it.

Statement V is a good one, and dwells upon the purchase of competitors.

This is in accordance with the New York gas case.

It would be more important if corporation commissions and other bodies would look into this phase of the case.

A man pays $40,000 for a plant. He rebuilds it at a cost of $80,000.

Would it not be just as fair to allow him to capitalize at $120,000 as it would be to let a competitor buy that same plant at $40,000 and add that sum to its capitalization?

There is more justification in this case.

The plant ran down because there was not enough earnings to take care of renewals.

The people really wore the plant out and did not pay for it.

Why not let the new purchaser add the purchase price to the cost of the new plant and let the people pay interest on the old account?

After all, the question of charging goes back to all that the traffic will bear.

Independent telephone charging was hardly based on this.

Yet their marvelous growth goes to prove that they really charged all that the traffic would comfortably bear.

We all know that the law is planned to prevent confiscation.

That the law plans mutual relations between buyer and seller is well known.

If I appear to wager 3 to 2 on Jones, I should be equally willing to take a bet of 2 to 3 against Jones.

That is the Golden Rule again.

It sounds well in theory, but it is not practised.

It is a sure thing that public utility corporations have their troubles.

But it is not due to competition. It is due to extravagance—foolishness—relatives—picking employes out of Sunday-school classes, etc. Too many trips to Europe. Too much unproductive work.

Entirely too many crimes are laid upon the doorstep of the competition tribe.

Literature for Chicagoans reminds me of another fable.

There was a city in danger of siege. A council was called to decide upon best means of fortification. The bricklayer urged brick. The carpenter urged timber, and the currier said there was nothing in the world like leather.

MORAL: A biased opinion is of little or no value.

Mayor of Portsmouth, Va., Wants Bell Telephone Company Investigated.

Mayor Reed, of Portsmouth, Va., has asked the State corporation commission to conduct such an investigation as it deems proper into the valuation of the Southern Bell Telephone and Telegraph Company's plant, in that city, with a view of ascertaining if it is properly valued for assessment. The Mayor took this action because he does not consider that the proper valuation is placed on the Bell company's properties in Portsmouth. The assessment as fixed by the State corporation commission is based upon a plant valued at $40,000. The Mayor in the face of expert examination into the Bell company's holdings in Norfolk considers that this is not a proper valuation of the plant in his city. "Expert investigation into the value of the company's plant in Norfolk," the Mayor said, "shows that it is worth more than $900,000, while it is assessed at less than $250,000.

Cumberland Planned to Improve Plant at Alexandria, La., After Question of Competitive System Was Discussed.

A report from Alexandria, La., shows that after the business men of that city had begun to talk of the advisability of installing a competing plant, the Cumberland Telephone and Telegraph Company came forward with a promise to improve its local system. As a result of this promise the Alexandria Progressive League has gone on record against the installation of a competitive system, but with a distinct proviso that this action is contingent upon the installation "within a reasonable time" of a common battery system by the Cumberland company. The Progressive League seems to consider that it is businesslike to be quite definite in this respect, saying, "We understand by a reasonable length of time, the time it takes to order and construct the switchboard, to buy and place on the ground the necessary equipment, etc., for the taking out of the switchboard, telephones and other apparatus, that it will be necessary to change to supply this service."

The League has also sanctioned the increasing of rates in connection with the new system.

Telephone Finances

Topeka Independent Company's Net Earnings Continue to Increase.

The statement of operations of the Topeka Independent Telephone Company of Topeka, Kans., for the six months ending July 31, indicates a satisfactory condition. The gross earnings increased 14 per cent, net earnings 8.9 per cent, and surplus for dividends or improvements 13.9 per cent over the corresponding period last year.

A comparative statement of the operations, signed by Theodore Gary, president, is as follows:

	Six months ending July 31, 1909.	July 31, 1910.	Increase.
Gross earnings	$77,445.62	*$86,273.57	$10,827.95
Expenses	40,607.51	* 48,053.51	7,446.00
Net earnings	36,838.11	40,220.06	3,381.95
Interest on bonds	13,667.68	13,824.90	157.22
Balance for dividends or betterments	23,170.43	26,395.16	3,224.73
Number of telephones owned by company			6895
Renewal reserve			$ 58,691.54
Bonds outstanding		$ 643,000.00	
Less owned by company		110,000.00	533,000.00
Capital stock authorized		$1,000,000.00	
Issued			400,000.00

*Includes tolls.

A Progressive and Growing Telephone System in Michigan.

One of the growing telephone systems in Michigan is the United Home Telephone Company with headquarters in Ludington. This company succeeded the Lake Shore Telephone Company about 4 years ago. The Lake Shore company had about 1,400 subscribers at that time, and the United Home company now has over 3,200 telephones in operation, and before the year is ended expects to have considerably over 3,500.

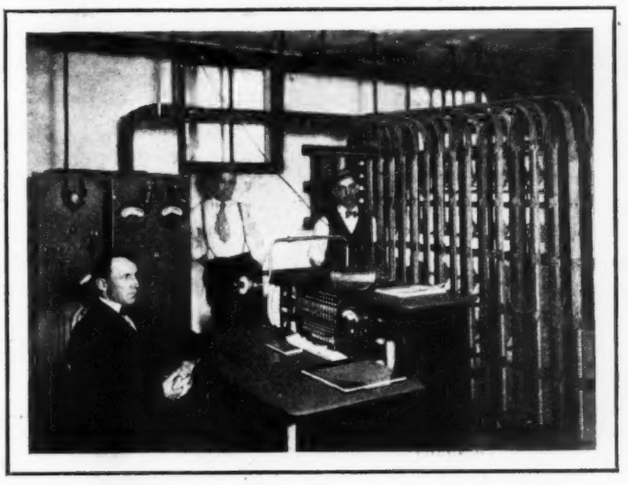
The Shelbyville Building of the United Home Telephone Company. The Whitehall Building is Similar in Design.

Exchanges are operated in Ludington, Scottsville, Fountain, Hart, Shelby, Pentwater, Montague, White Hall, Crystal Valley, Walkersville and Hesperia. A solicitor is employed only in Ludington. Outside of Ludington the company operates over 90 per cent of the telephones in the territory it covers. Its lines cover Mason and Oceana counties and extend into Newago, Muskegon, Lake and Manistee counties.

In its last fiscal year the growth of toll business showed an increase of 22 per cent, while the percentage of growth in April over the corresponding month in 1909 was 12 per cent. During the first four months of this year 160 subscribers were added to the list.

Toll lines of the company are also used for conveying messages of the Postal Telegraph Company, and its offices at Ludington and Hart are connected with the telephone company's offices.

Within the past two years, the system has been entirely rebuilt. A new building costing $6,000 was erected in Ludington, and buildings involving an expenditure of $2,000 were constructed at Shelby and Whitehall. The outside plant in Ludington is all cable, while in other places the can top construction is used, except in the outlying districts. The aerial and underground cable in the various places is as follows: Ludington, 85,000 feet; Scottsville, 3,800 feet; Pentwater, 1,700 feet; Hart, 14,000 feet; Shelby, 7,800 feet; Whitehall and Montague, 16,200 feet. The Ludington switchboard board is the Kellogg 4-party common battery type with 680 lines equipped. Separate boards are used to handle the long distance traffic. The equipment in the balance of the exchange is of the 4-party selective magneto type, with the latest protective devices.



The Terminal Room in the Ludington Exchange.

The Main Switchboard and Chief Operator's Desk in the Ludington Office of the United Home Telephone Company.

Of the stock 95 per cent is owned by 201 local stockholders. Its present rate of dividends, payable February 1 and August 1, is 6 per cent.

Directors of the company are J. C. Flood, banker and capitalist of Hart; C. L. Churchill, Banker, Shelby; H. S. Newton,

fruit farmer and capitalist of New Era; J. B. Conger, New Era; J. F. Wing, banker, Ludington and Wm. Rath, mayor of Ludington and capitalist.

W. A. Cartier of the Cartier Lumber Company and the Cartier Manufacturing Company, is president of the company; G. T. Sands, a banker of Pentwater, vice-president; and the secretary, treasurer and general manager, is Thos. Bromley, Jr.

Joplin Company's Net Earnings for Six Months Show 33 Per Cent Increase Over Corresponding Six Months Last Year.

For the six months ending July 31, 1910, the Home Telephone Company of Joplin, Mo., shows a remarkable increase over the corresponding period last year. The gross earnings increased 14.7 per cent, net earnings 33.7 per cent and the surplus 52.1 per cent. This company is part of the Gary system, which has a reputation for good management. The comparative statement of the operations is as follows:

	Six months ending July 31, 1909.	July 31, 1910.	Increase.
Gross earnings	$63,314.29	*$72,624.38	$9,310.09
Expenses	39,711.43	* 41,050.41	1,338.98
Net earnings	23,602.86	31,573.97	7,971.11
Interest on bonds	13,105.00	15,605.00	2,500.00
Balance for dividends or betterments	10,497.86	15,968.97	5,471.11
Number of telephones in use and owned by company	5771	6682	911
Renewal reserve			$ 22,309.53
Bonds outstanding		$617,000.00	
Less owned by company		78,000.00	539,000.00
Capital stock authorized		$750,000.00	
Issued			374,250.00

*Tolls not included.

Theodore Gary, president.

Cumberland Earnings Show South a Profitable Field for Telephone Investment.

Rumors of another melon cutting by the Cumberland telephone company are in the air, a Nashville correspondent reports. The last statement of the company shows that the profits are running up around $200,000 per month, or about 12 per cent on the capital stock. The operating expense is less than 65 per cent of the telephone revenue. The company has from year to year increased its dividends, until they have climbed from 4 per cent to double that, or eight per cent. With the earnings at 12 per cent reports are that something will have to be done to get rid of that surplus. For the six months of this year on a capitalization of $19,680,150 the gross revenue was $3,366,009.18 and the net revenue $1,162,433.11. Fifteen exchanges and 6,569 subscribers were reported as added during the six months. The surplus is reported as $3,969,167.88, reserves at $2,250,134.51, and undivided profits at $375,227.11.

$12,000 Cash Added to Plant of Kansas Company Out of Year's Earnings.

The Hays Telephone Company, Hays, Kans., during the year 1909 added about $12,000 out of the earnings to the cash value of the property, making a total valuation of $35,000 on the system. The additional money was applied in a new central office building and new equipment, besides rebuilding the city lines. This system is owned solely by H. J. Penney of Hays, who is postmaster and a dealer in real estate investments, and is under the management of H. F. Anderson.

Exchanges are operated in Hays, Victoria, Walker, Gorham, Catherine, Herzog, Munjor, Pfeifer, and several toll stations are also maintained. The system extends over an area of about 500 square miles, with a population of 8,000 inhabitants. Service is given to over 500 subscribers at $1.50 and $1.00 monthly rates for business and residence service, and $1.25 for rural service. A charge of 10 cents is made for farmer switching. During the first six months of the year 35 subscribers were added to the list.

The equipment is in good condition. A new 400 line switchboard was installed in Hays a little over a year ago. The system is all cable, there being in the city about 8,000 feet of aerial cable and 2,000 feet underground cable, laid in wood fibre conduit covered with cement. All toll lines, of which the company owns about 60 miles, are No. 12 B. B. iron wire, metallic circuit. Private line service is given throughout.

The toll lines between Hays and Russell are now being rebuilt, making them standard No. 10 copper wire, metallic circuit.

A Successful Ohio Company.

In 1902 the Ottawa County Telephone Company was organized and incorporated in Elmore, O., with but a limited number of subscribers. Since then it has grown rapidly and steadily, and at present gives service to over 2,250 subscribers, and operates exchanges in Elmore, Curtis, Millbury, Genoa, Oak Harbor, Pemberville, Port Clinton, Prairie Depot, Put-in-Bay and Woodville. Shortly after the incorporation of the Ottawa county company, it purchased the system of the Port Clinton Home company, and the officers then saw fit to reorganize The name was changed to the New Ottawa County Telephone Company.

The territory in which this company operates, covering all of Ottawa county, with two small exchanges in Wood county and one in Sandusky county, has a population of 24,000 inhabitants.

Since the first of the present year 71 new subscribers have been added to the list, in addition to those of the West Milgrove Telephone Company of West Milgrove, Seneca county, which system was recently purchased.

The toll business increased 1½ per cent in the last fiscal year over the one preceding, and the percentage increase for the month of July over the same month a year ago is 4 per cent.

Its rates for service are $1.50 to $2.00 for business; $1.00 and $1.25 for residence, and $1.25 and $1.50 for rural service. It owns all its local and rural lines, and also 400 miles of metallic circuit toll lines. The Put-in-Bay and Port Clinton plants are of all cable construction and part of the balance of the system is also cable.

The New Ottawa company has an authorized capital stock of $250,000, of which $163,100 has been issued, has no outstanding bonds and no authorized bonds.

The rate of dividend has been substantial since its incorporation. From 1902 to 1905 the company paid 7 per cent dividends on a capital of $124,000; in 1905, 8 per cent was paid on the same amount. In 1906 the capital stock was raised to $150,000, and a dividend of 8 per cent was also paid that year. In 1908 the capital was again raised, an issue of $7,000 being made, and in 1909 was increased to its present amount, $163,100. The dividend paid in both 1908 and 1909 was 8 per cent.

The stock is held locally by 130 holders, and although the securities are not listed on any stock exchange, there has been considerable trading of stock, and it has sold as high as 120. The company reports that it has no trouble in disposing of whatever stock it wishes to sell.

The financial statement issued for the six months ending April 30, 1910, shows the company's gross earnings to be $20,379.76; and expenses, $11,482.71, a net earning of $8,897.05. The depreciation fund is well looked after by the company, $40,000 being reserved for that purpose.

The officers are E. D. Harkness, of Clyde, president; H. W. Nieman, Elmore, vice president; Homer Metzger, Clyde, secretary; Taylor Fuller, Clyde, treasurer, and C. L. Braucher, general manager. Directors are those mentioned and E. E. Wenger, of Port Clinton.

Telegraph and Telephone Systems as Affected by Alternating Current Lines*

By J. B. Taylor

Harmonics and irregularities.—When the electromotive force wave of a generator, as measured between the neutral and one of the terminals, contains third harmonics, and other harmonics which are multiples of the third, these harmonics are in the same phase relation in the three windings. Grounding the neutral point brings the potential wave of these praticular harmonics on all three of the line wires in the same phase relation. Electrostatically considered, therefore, with reference to the third harmonic the three wires may be regarded as a single wire whose potential to ground varies at triple, and multiples of the triple, frequency. The possible resulting disturbance will depend entirely on the magnitude of these harmonics. The writer knows of but one case where trouble was experienced with telephone lines as the result of grounding the neutral point of generators, and in this case there was nothing to show whether or not the telephone line was in fair condition for exposure to the high-tension transmission line. In several tests made it has been impossible to tell, from the telephone line, whether the neutral connection was grounded or not. In one instance an ordinary telephone receiver was connected betweeen ground and the neutral of a 2000-kw. 13,200-volt generator, in service and feeding, through several thousand feet of cable and six or seven miles of transmission line, a 1500-kw. synchronous converter. The noise was no greater than is occasionally heard on a commercial telephone line in trouble. This somewhat dangerous experiment was performed only after finding that the triple frequency charging current on this system was too small to be measured on commercial alternating-current instruments.

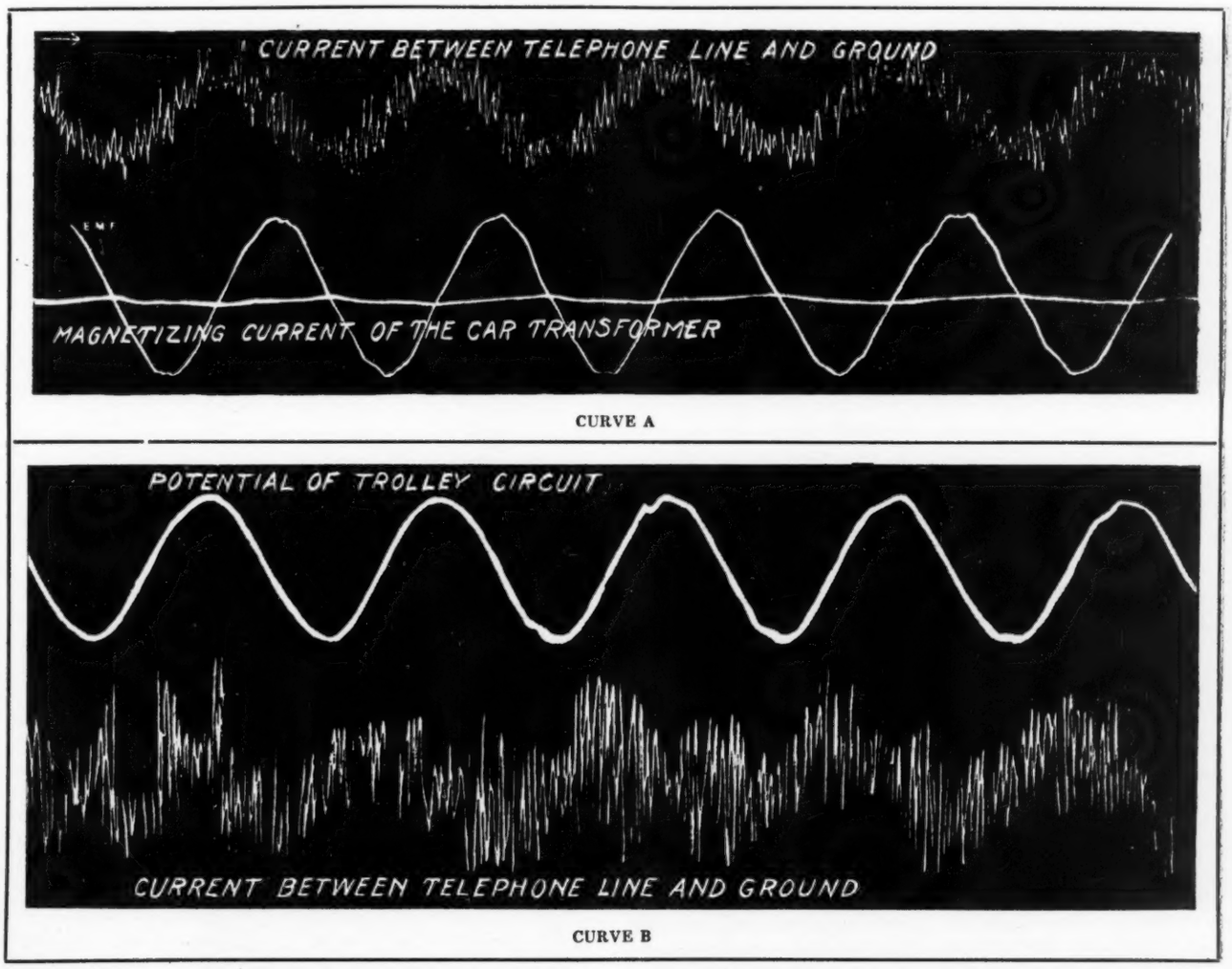


Fig. 7—Oscillograms Showing Charging Current Between Telephone Line and Ground in Proximity to a Single Phase Trolley Wire.

Variable permeability and the hysteresis and eddy-current losses in transformers result in a distorted wave of exciting current. This distorted current-wave can be resolved into third harmonic components which may, for certain combinations of transformer connections, result in third harmonic potentials between three wires (regarded

*Abstract of a paper presented before the American Institute of Electrical Engineers, New York, Oct. 8, 1909, and printed in the October Proceedings. Concluded from issue of September 3.

as one) and ground. For other connections, triple-frequency currents may circulate through a circuit made up of transmission wires and ground.

The symmetrical construction of field poles and winding of alternating-current generators causes positive and negative waves to be of the same shape, and hence free from evenly numbered harmonics.* These even harmonics, nevertheless, may be introduced into a power system if transformers or other pieces of apparatus contain iron which is permanently magnetized. Ordinarily, transformers are free from permanent magnetism, but in circuits involving earth return there may be considerable direct current passing through the windings, derived from neighboring direct-current trolley systems, etc.

Even where the generated electromotive force wave is comparatively free from harmonics, the various pieces of apparatus on the system will all have their effect on the potential wave. An instructive experiment on this line is to connect a telephone receiver in series with a small condenser, to alternating-current house-lighting mains. The number of strange noises heard in such a case, due mainly to induction motors on the system, will be a surprise to any one who has not tried this simple experiment.

Oscillograms, Fig. 7, show the charging current between telephone line and ground, the same being in proximity to a single-phase trolley wire. Curve *a* is the charging current between the telephone line and ground with cars at standstill, and curve *b* with cars in operation.

On account of the much greater sensibility of the telephone receiver to sounds of high frequency, these irregularities in the potential wave, although of much smaller magnitude than the fundamental frequency, are much more likely to be heard in neighboring telephone lines, when transpositions and other points of balance have not been given close attention. A condenser connected between alternating-current wires and earth, will, to a certain extent, absorb these high-frequency irregularities.

It should also be noted that the various neutralizing connections later discussed, as well as neutralizing for the fundamental frequency will, to some extent, neutralize also for higher frequencies.

Single-phase Railway.—The several typical diagrams of Fig. 8 show the transformation and distribution arrangements for the latest addition to the alternating-current field —the single-phase railway.

Diagram A shows the single-phase system in its simplest form. One terminal of a single-phase generator is connected to earth and the other to an overhead trolley conductor. The return circuit is made up of steel rails and earth. Neglecting line drop, the overhead conductor is at the same potential throughout and there being no neighboring conductor of opposite polarity, there will result electrostatic fields of constant strength irrespective of number of cars in operation. From the standpoint of inductive disturbances, this is the worst arrangement that can be made with the single-phase railway system. Electromagnetic effects will be proportional to the length of transmission and to current, and vary with load and distribution of cars.

Diagram B is just as bad electrostatically, but by locating the generating station at the middle of the line, instead of at the end, the maximum length of feed is reduced to one half, and, depending on the running schedule of the cars, there may be a still further reduction in magnetic inductive effects through more or less neutralizing action from currents in opposite directions, to supply cars each side of the generating station.

Diagram C is an extension of B through the addition of transmission line and transformer sub-stations. Again considered from an inductive standpoint, this is better than B only through the feasibility of reducing the length of the individual sections. Diagram D is essentially the same as C except that transformer connections have been so made that alternate sections are of opposite polarity. Consequently, the equal exposure of a telephone or telegraph line to the same number of positive and negative sections will practically neutralize the effects of electrostatic induction. In this connection it should be noted that there will be charging currents flowing back and forth in a neighboring telegraph wire from the portion opposite the section of single-phase trolley of one polarity, to the neighboring section of opposite polarity. If there be intermediate stations on the telegraph line, these charging currents, flowing from one section of the wire to the other, may be sufficient to disturb the relay. From a railroad point of view, a section of trolley wire fed from a single sub-station is liable to tie up the whole road if a single sub-station goes out of commission. The circuit arrangement next to be considered obviates this difficulty by the use of trolley sections continuous between sub-stations, thus giving duplicate feed.

Diagram E shows a typical arrangement of a single-phase trolley wire continuous between transformer sub-stations. In this arrangement all trolley sections are of the same

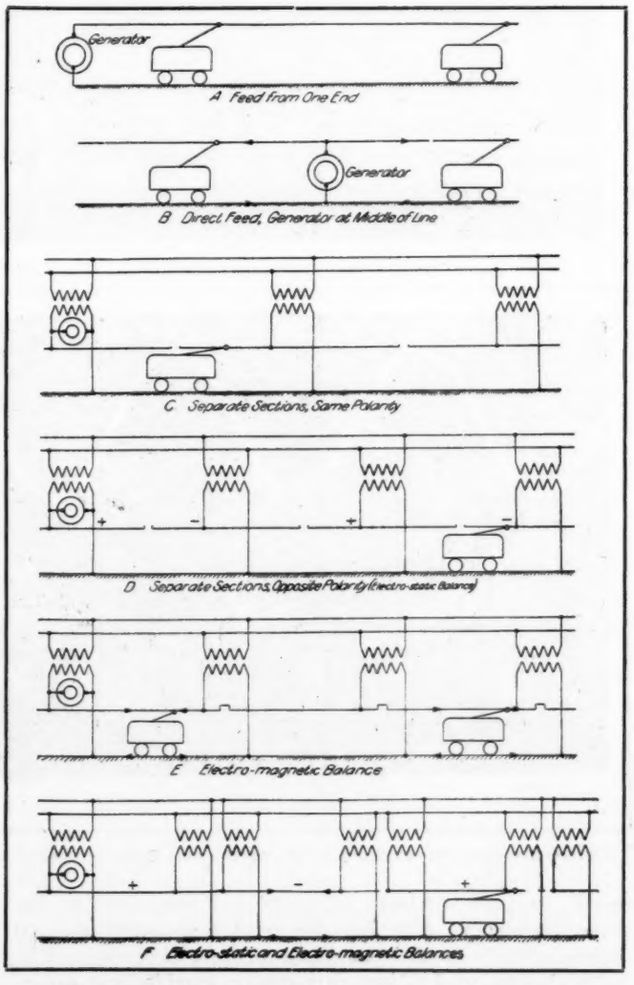

Generator
A Feed from One End
Generator
B Direct Feed, Generator at Middle of Line
C Separate Sections, Same Polarity
D Separate Sections, Opposite Polarity (Electro-static Balance)
E Electro-magnetic Balance
F Electro-static and Electro-magnetic Balances

Fig. 8—Distribution System for Single Phase Railway.

polarity with corresponding electrostatic effects. From the standpoint of electromagnetic induction, however, this system of distribution has marked advantages. Assuming equal transformer potential at two adjacent sub-stations, a car midway between stations will draw equal current from

*See "Even Harmonics in Alternating Current Circuits," Proceedings A. I. E., July, 1909, pp. 963-970.

the two sub-stations. These equal currents flow equal distances but in opposite directions, with a consequent neutralization of the electromotive force induced in neighboring telegraph or telephone wires. This neutralization also holds for positions of the car when other than at the half-

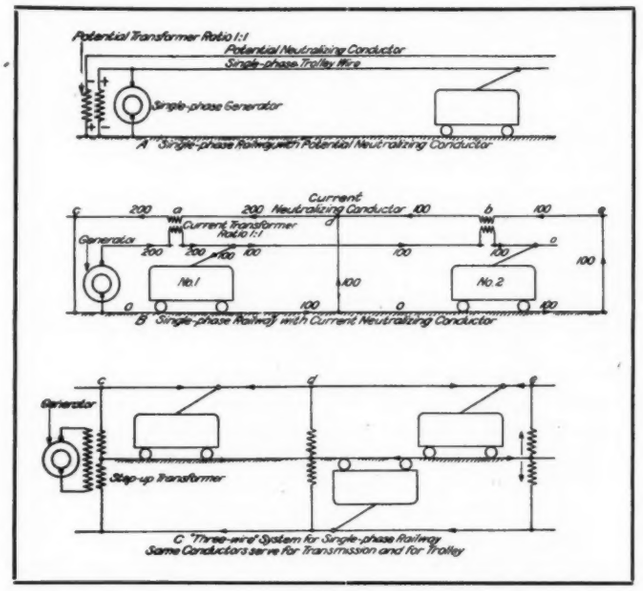


Fig. 9—Neutralizing Conductors for Single Phase Railway Distribution.

way point, for while greater current will flow from the nearer sub-station, this greater current flow through a shorter length of trolley wire than does the lesser current from the farther sub-station.

The next step is to combine the two arrangements as shown in diagram F, where trolley sections are fed from both ends, and alternate sections are of opposite polarity. This arrangement requires either two transformers at some of the sub-stations, or, what amounts to the same thing, a transformer with two secondary windings.

In the various distribution schemes already discussed, the neutralizing action, if any, is the differential effect between two or more sections. At any given point there is no neutralizing action, either electrostatic or electromagnetic. Consequently these arrangements are effective only where a telegraph line runs parallel to a number of sections at approximately the same distance.

While it would be possible, it is by no means easily practicable to have a double-trolley, single-phase railway system; and, considered inductively, such a system would be on a par with any of the other metallic-circuit, alternating-current systems.

The various distribution arrangements for a single-phase railway, as shown in Fig. 8 and just considered, require no additional conductors, although the transformer substations to accommodate the special arrangements may be an added item of expense.

We will next consider the several distribution arrangements requiring additional conductors. Fig. 9 shows several schemes of distribution designed more or less to represent metallic circuit conditions, still retaining the single trolley. Diagram A shows a potential-neutralizing conductor erected in proximity to the trolley wire. By means of one or more transformers, this wire is maintained at approximately the same potential to ground as the trolley wire, but always of opposite polarity. Such a conductor will neutralize the electrostatic fields. It is more or less obvious that this neutralizing conductor might be placed nearer to a telegraph line than is the trolley wire, in which case a proper transformer ratio could be selected to neutralize the potential at the position of the telegraph wires. Such an arrangement, however, would be most effective for a single line of telegraph and would involve either extensive calculations or experiments to insure the best results. By having the neutralizing wire as close as possible to the trolley wire, no calculations or experiments are necessary, and the same wire will neutralize equally well for various telegraph lines, even if on opposite sides of the track and at various distances.

Diagram B shows a current neutralizing conductor in proximity to a trolley wire. This conductor must be made of the same carrrying capacity as the trolley wire, and current transformers, ratio 1:1, are cut into the trolley wire and neutralizing conductor at intervals. Midway between these transformers the neutralizing conductor is connected to the rail. The purpose of this scheme is obviously to cause equal currents to flow in opposite directions in the trolley wire and neutralizing wire. For certain positions of the cars, the neutralizing action will be insufficient: for other positions of the cars, an over-neutralized condition will result. By using a number of transformers, approximate neutralization may be obtained. The objection to this and similar arrangements is the extra expense of the neutralizing conductor and transformers, and the greater chance of shutdown due to the quantity of high-tension apparatus distributed along the line. As against the expense of the extra conductor it should be noted that such a circuit will have small self-induction as compared with the usual single-phase circuit with overhead conductor and earth return. The inductive drop will therefore be considerably less, which may be an important factor in some cases.

By installing a potential-neutralizing conductor as described in diagram A, and a current-neutralizing conductor as well, metallic circuit conditions are approximated. A single current-neutralizing conductor of sufficient carrying capacity might serve for trolley wires over two or more tracks, and similarly, single potential-neutralizing conductor might serve for more than one trolley wire, either by increasing its size or the voltage supplied to it.

Diagrams C and D show arrangements where the same conductor tends to neutralize for both current and potential. Looked at from one point of view, these arrangements are similar to the Edison three-wire system, the rail return being the neutral. Compensators, or 1:1 transformers, keep the two conductors at equal and opposite potentials from earth, and the second conductor may or may not be used as a trolley wire. In the case of a double-track road, both conductors could advantageously be used as running conductors. 1:1 current transformers interconnecting the two conductors cause equal and opposite currents to flow in the two conductors, similar to arrangements in diagram B. Diagram D is the same as C without the current transformers, and this arrangement can be regarded as a high-tension transmission system of double the working trolley voltage. The transmission conductors thus form two working trolley conductors with neutralized electrostatic, and partly neutralized electromagnetic effects.

There's a Reason.

"I tell you vot, Osgar, I can't get used to dose telephones."

"Vot iss der matter mit?"

"Vell, efery dime der bell rings und I answer by him, dey ask me 'Who's dere?' Yust like I wass nod in mine own house, yet."

"So iss idd by me, Adolf, so soon already. But vot I comblain iss dot I alvays haf to take der receifer off der hook. I should dink id vouldt be cheaper ef day dit nod haf a hook."
—Cleveland, O., *Press.*

Importance of Right Attitude of Employes Toward the Service*

By W. K. McQuown

Given certain equipment and conditions, the results obtained will depend directly on the personal efforts of the men and women who furnish the motive power of the organization. And the man in charge had better not rest satisfied until each unit in the organization is making a distinct personal effort toward perfecting the service.

Every operating man knows that the polite, obliging operator who knows her business, and attends to it, can give better and more satisfactory service with half worn out magneto equipment, than a grouchy, unaccommodating operator, too indifferent to be prompt or accurate, can give with the best and latest common-battery equipment on the market. Every operating man knows that the troubleman who clears his troubles permanently is worth twice as much to the service as the man who renews the batteries and lets it go at that, when a little investigation might show the reason why the telephone "don't talk well," is because the instrument is a trifle out of adjustment. And every operating man knows that the drop wagon foreman who allows connections to be tapped without soldering, because it is the easier way, should be banished into outer darkness. In short, the work of the men and women who make the wheels go round—who build the lines, and install the instruments, and clear the trouble, and keep the accounts, and handle the cords and keys at the switchboard—is responsible for the service. And their attitude toward the service can make or mar the public's opinion and correspondingly affect the development of the business.

What is the right attitude? "Everything for the good of the service." Of course, we all understand that. But the question is, how can this attitude be attained and maintained by an exchange force which has not already gotten it?

In the first place, there is mighty little room in the telephone business for any but bright, intelligent men and women. In order to get good results we must have that kind of people on the exchange force—people who can think. And then all that is necessary is to get them to think about the one important thing—the service.

Let us take for example the operating force. The operators come in contact with the public many times oftener than anyone else connected with the service, and their work is correspondingly important. Let us see if a little educational talk with each operator, in an effort to broaden her view of her work, and her responsibility to the service, will not have a good effect.

Suppose we explain to her first that the first, last and only duty of the telephone company is to give service, and that the better she does her work the better the service will be. Then let us show her why, in order to give good service, she has to obey so many different rules and regulations.

The telephone operator has many duties to perform. She has first to take care of her subscribers, which means that she must answer all calls promptly and courteously, get the desired connection as quickly as possible, soothe the impatient subscriber who can't understand why his party doesn't answer, and dispense sunshine and good nature to the public all day long. Then her duty to the company demands that she be prompt and regular in attendance, handle the switchboard apparatus as easily as possible so as to keep down maintenance on it, and look out for the company's interests generally whenever the opportunity presents itself. Her duty to the other operators requires her to handle cords, keys, etc., quietly, and to modulate her voice so as not to confuse her neighbor operator, to refrain from any social conversation whatever when on duty, to help in completing connections, etc., and in short, make it easy for her neighbor to get the best possible results. And then her last, and probably her most important duty, did she but realize it, is to herself. It is her duty to herself to be just the best telephone operator she possibly can be—to give her intelligence and ability a full chance to win for her any advancement in salary or position that may offer itself. And the way for her to do this is to keep before her all the time the fact that the *service* is the thing, and that her work is good only in the same degree that the service is good.

This presentation of facts, if made in a personal talk with each operator, or with a force of operators collectively, will be bound to stimulate a healthy and *permanent* personal effort toward improving the service, because of the realization that the service is of paramount importance. A similar talk along the same lines, the object being always to show plainly that perfect service is the one end and aim of the business, will be bound to produce like results in other departments, if the men are the right kind—the kind who think.

The "please" and "thank you" spirit must pervade an operating force every minute of the day, in order to get proper results in the way of service. The troubleman must courteously explain to the lady of the house why her telephone would not work, in language that she can understand, or she may get the idea that the service is not dependable. The installer must put the telephone in the most accessible place for the subscriber, even though it is not the easiest place in the house to reach with the wires, because it will then be easy for the subscriber to answer promptly.

The right attitude in all these and a hundred other matters can only result from a genuine personal desire on the part of each employe to make the service as good as it can possibly be made. And only when this spirit pervades the entire force can the best results be obtained.

The man or woman who will not voluntarily direct his or her best efforts toward the service, after being made to understand how supremely important good service is to the welfare of the business, will, if retained, eventually prove a detriment to the business. Too many employes are working for a salary and incidentally giving a little service. A better way would be to work for service and consequently draw a salary, the size of which will certainly adjust itself to the results obtained. This is possibly a broader way of looking at telephone work than the average worker ordinarily uses, but it is certainly the right one—the service first, with the salary as a result.

Someone has said: "There is no excellence without labor." I would suggest an amendment to that as applied

*Abstract of a paper presented at the annual convention of the Kansas Independent Telephone Association at Topeka, Kan.

to the telephone business: "There is no excellence without labor and enthusiasm." The marvelous growth of the business in the past few years has been such as to instill enthusiasm in everyone connected with it—so much so that those who haven't been enthusiastic have hardly kept up with the procession. And the enthusiastic exchange force, in which every individual does his or her best to give "instantaneous, get-out-of-orderless" telephone service, will go a long way toward putting a telephone in every office and residence in the community.

A New Jersey Company's Directory.

The new directory of the Paterson, Passaic and Suburban Telephone Company, Paterson, N. J., shows a substantial increase in subscribers since the beginning of the year. As in most places the business men recognize the value of advertising in the telephone directory and as a result this one has a generous amount of advertising. The book is neatly bound in a heavy manila paper, with the Shield prominently displayed on the cover. General instructions on the use of the telephone are given throughout the book; and the following appears on one of the first pages, "The Independent Telephone has done more for the improvement of Telephone Equipment and Service than all of the inventions in the science." On the inside of the front cover is an extract from the decision of the Supreme Court of New York in the Yates Hotel lease, regarding competition. Both the quotations have appeared on the editorial pages of TELEPHONY. The Supreme Court decision quotation could be reproduced to advantage in the directories of all the Independent companies.

Officers of the company are, H. R. Swartz, president; W. J. Hancock, vice-president; J. U. Lindsay, secretary and superintendent and C. W. Wright, treasurer.

Developing Business by Telephone.

The following article by Ernest Van Dyke published in a recent issue of Office Appliances shows that others beside those engaged in the telephone business are engaged in promoting the use of the telephone.

A point not heretofore considered, perhaps, by dealers generally is the utility of the telephone in keeping in daily touch with the needs of their customers. Merchants in other lines have tried it with success, and there may be an opportunity here for dealers in stationery and office appliances to take a leaf from others' book and stir up a little trade which now lags from want of a reminder.

This means the use of the telephone in a positive instead of in a negative way—not waiting for the customer to call up the dealer, but calling up the customer and making polite inquiry or suggestions—inquiry as to the needs of the customer and suggestions from time to time as to the new goods and appliances in stock.

In Chicago there are many merchants who use the telephone in this way. The opportunity, of course, is greatest in the case of the grocer who must keep in daily touch with his trade. There are several stores which maintain a regular telephone department with a couple of clerks whose duty it is to call up the regular customers every morning, take their orders and make suggestions. It is the policy of the merchant to put capable men or women in charge of the telephone desk and to keep them posted right up to the minute with regard to all the fresh goods which arrive, new goods in the market and goods ordered, so that customers may make their calculations in advance. Many sales are thus made that would be otherwise overlooked, because the customer is kept informed at all times of the resources of the store to meet her needs.

The only reason, of course, why the salesman must be thoroughly informed about his goods is that he may pass his information along to the prospective customer in a way that will help to create in the mind of the customer a desire to buy. There appears to be no valid reason why the merchant should not avail himself of the quickest means of imparting this information to a selected list of customers, doing so, of course, with discretion and judgment so as not to trespass upon the time of the customer or offend those who happen to be of an irritable disposition. Perhaps, in the case of the stationer and the dealer in office appliances it would be well to limit this telephone work to once or twice a week. The average office does not need supplies oftener than that, and many not so often, but the judicious use of the telephone serves to keep the dealer in touch with his clientele, will be the means of getting some business and will keep the name of the dealer in the mind of the customer.

The office appliances dealer of all men should be quickest to avail himself of all that is best and most modern in the business game. The improvements in telephony have placed the service at the command of everyone at a remarkably low price even for unlimited service. The merchant who supplements his other methods of reaching his trade with a proper use of the telephone will convince his trade that he practices what he preaches.

When the dealer secures an agency for a new device we are inclined to think he will stand a better prospect of success if his enthusiasm is heated up to the point where, in his glee, he cannot rest contented until he has called up all his regular customers with whom he sustains friendly personal relations and tells them about what the new device will do for them. If he does not take a single order by telephone he is still the gainer, for if his talk is right somebody will be sure to remember it and in passing will drop in for a look at the new machine. In this way many sales will be made. Indeed, if only a few sales are made in a year traceable to the telephone yet nevertheless the method, if followed at convenient moments when other work does not press, will have justified itself abundantly.

Industriously keeping at one's business is bound to bring success, provided one uses ordinary care and judgment in the conduct of it. The idea of keeping ones' self constantly in the minds of customers is one whose value has been proved by the experience of all large advertisers. The telephone has not heretofore been used as a medium for advertising to any great extent, but in addition to the orders which may be directly taken by means of the wire, it is incidentally a medium for publicity. It helps to get the store a reputation for being up-to-date.

Taking orders over the telephone is not something that every dealer can undertake without consideration of his trade and of his own circumstances, but where he can afford to select a list of customers to call up once a week and make his telephone service a sort of brief bulletin of his store, we believe there are places where such a plan would pay.

Omaha's Assistant Attorney Claims Bell Company Furnishes Him Inferior Service.

According to a recent item in the Omaha, Neb., Bee, I. J. Dunn, assistant city attorney, states the telephone in his office is so poorly made and so poorly taken care of that it does not legally constitute telephone service at all, and in an official opinion delivered to the city council August 27 he declared that the Nebraska Telephone Company has no right to ask payment for what it offers.

Mr. Dunn asked that a hearing be given the matter at the meeting of the committee of the whole, at which time he would elaborate his grounds for protest.

The world can't down the man who laughs and fights too. —H. M. Martin.

Letters from Observing Workers

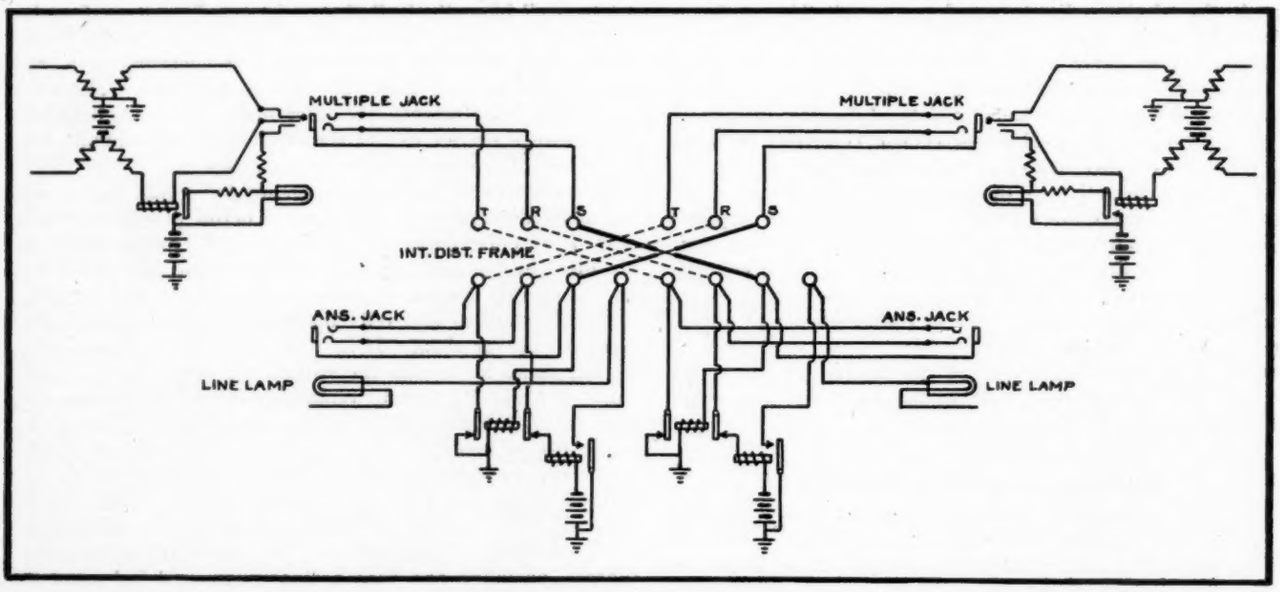
Crossed Jumper Wires Cause Intermittent "Can't Get Central" Trouble.

We had one subscriber who was continually complaining that he could not get his operator "at times" until we were about to put him on as a "chronic," when a little further investigation brought to light the real cause of his complaint.

As all equipment, central office, line and station had been repeatedly inspected for opens, loose joints, etc., and still the subscriber entered his "kick," it was decided to rewire everywhere it was practical to do so.

This, of course, meant new station wiring, cut-in, change of cable pair, new jumpers on M. D. F. and I. D. F.

The central office work was done first, after which it was found unnecessary to do any more, for when the three-wire jumper was loosened on the I. D. F. it would not slip out easily. It was found to be tangled with another jumper; both sleeve wires were found to be worn from constant "sawing" across one another until the insulation was off for about 2½ inches.



Crossed Sleeve Wires of Jumpers Made Both Cut-Off Relays Operate When Either Line Was in Use.

These were twisted together in such a manner that they were constantly in contact.

It was only "at times" that the subscriber could not get central, and it became evident that this was the cause of the trouble, for it is clear by reference to the illustration that if either line were in use *both* cut-off relays would be operated, which would prevent the other party from getting central.

Strange to say, the other party whose line was affected by this trouble had not complained.

After this jumper was replaced with a new one we heard of no more trouble of the line in question.

Atlanta, Ga. L. O. Surles.

Service Efficiency of Phantom—A British Criticism of Nomenclature.

Upon your invitation to discuss the question of "Unbalanced Phantoms" the undersigned would appreciate the opportunity of briefly expressing his opinion on the subject in TELEPHONY'S columns.

Beginning with the reply on page 78 of the July 16 issue to the querist asking for information concerning his proposed phantom circuit upon a pair of metallic party lines. Although you wisely refer with caution, while estimating the initial costs, to a *possible* economy in superimposing the third loop circuit as against the building of a new metallic line, you do not make any reference to the comparative service efficiencies or maintenance charges of the two methods. From a service viewpoint in this extreme case, where a number of permanently connected party line subscribers are to be served by the three circuits and repeating coils introduced into the two "base lines" to accommodate another telephone en route, I consider the working results would be very poor as compared with a new loop line properly constructed and transposed, and would be, generally, a source of annoyance to the subscribers as well as the operating company. Every fault occurring on any of the four wires forming the base lines or on the phantom line extension would impair the working of the whole until the troubleman could clear the defect.

The faults on long composite circuits arranged on the plan indicated cannot be located by any test method, but must be run down in each case. These are great disadvantages and dertimental to the service. The chances of failure would be as 6 to 2 in favor of the new iron loop for every one of the subscribers connected.

Excepting such extreme cases, phantom or duplex circuits are often of great service to the telephone company for order wire and call circuits between exchanges and especially in serving toll line communication between distant towns, where a number of well-built metallic circuit lines exist and where external electrical disturbances are not too prevalent.

The writer has had under observation similar circuits working for several years over distances exceeding 90 miles on mountain pole routes in Chile, South America, and they have usually given good results. The lines are mostly built of No. 14 S. W. G. copper, but some are of 250-lb. iron. They are carefully built, with transpositions correctly located to eliminate inductive disturbances, and vigilant supervision is maintained to keep down faults. In addition they are periodically overhauled, trees cut, wires regulated, etc., and tests made to insure a satisfactory electrical balance. The best phantom is one superimposed upon two metallic base or personal lines

of copper and arranged so that whenever either of the four copper wires becomes grounded, open or otherwise defective it can be switched off to relieve the good loop.

Continuous telegraphic service also is given by a simplex circuit or another set of lines running over the same pole route without interference. Temporary telegraph communication was maintained with remarkable results for several weeks on one busy telephone iron wire loop by the aid of duplex repeaters and condensers. These facilities are an acquisition of no small moment, and so long as a telephone company maintains its lines in first-class working order it may derive considerable benefit from this class of service.

No doubt the good working of phantom circuits entirely depends upon an electrical balance being sustained throughout, even in the switchroom wiring up to the terminals. A perfect phantom is analogous to a galvanometer circuit in a bridge test when the needle or spot is at zero—an ideal never realized in practice, but a good one for every telephone engineer to aspire to. Those who advocate the employment of phantom circuits will need to devote very special attention to the construction and maintenance of their lines. Successful phantom working is a guarantee of excellence in these respects.

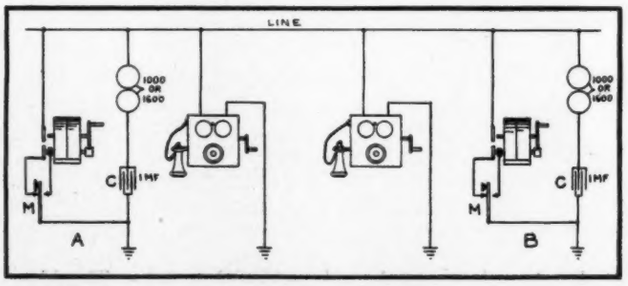
It does appear curious, as your correspondent states in TELEPHONY, page 106, for July 23, that no cross talk has been experienced on his copper-iron-phantom circuits. The writer has also observed splendid working of a duplex superimposed upon an iron loop and a copper loop, but they were on different pole routes.

I do not understand what your correspondent means by "phantom transpositions." Are they apparitions too, like the extra circuit? The name "phantom" is a good one for duplex or superimposed circuits, which, under the latter names, have been in use in England and elsewhere for many years, but the term phantom is hardly applicable to transpositions and coils, which are material, and their present denomination is sufficiently significant. Again, instead of calling the wire lines "physical" ones, as, literally speaking, of course they are, would it not be more appropriate to name them the "base lines,' because as a matter of fact they are truly basic to the superimposed circuit? A copper metallic line in this respect would then be called a "copper base loop."

Birmingham, England. C. A. Smith, A. Am. I. E. E.

Secret Signaling Between Stations on Grounded Party Line.

Telephone workers sometimes have occasion to arrange two telephones *A* and *B* on a grounded party line so *A* can signal *B* and *B* signal *A* without ringing any other bell on the same line, and yet be able to signal and receive a signal from all other stations on the line.



Condenser C, by Its Discharge, Causes Bell at A or B to Ring with Pulsating Current.

I have found that a circuit arranged as shown in the drawing is very simple, cheaply and easily installed and gives very good satisfaction for an arrangement of that kind. Referring to the sketch, one will notice that stations *A* and *B* have each one m.f. condenser in series with the ringer. This is the only change which must be made in the circuit, and all the extra apparatus needed, provided the telephones *A* and *B* are furnished with a combination alternating and pulsating current generator. If not it will be necessary to install a combination generator which will give either alternating or pulsating current.

The operation of the circuit is as follows: When wishing to signal from *A* to *B*, or *B* to *A* secretly, press the button *M* and turn the generator crank in the usual way. This causes pulsating current to flow over the line, pulling the armatures of all the ringers to one side and keeping them silent, except those on telephones *A* and *B*, which will ring in the usual way, by getting the opposite phase of the current wave, negative or positive, as the case may be, from the discharge of the condenser *C*. If key *M* is left in the normal position, signals are given and received in the usual way over the entire line.

Hiawatha, Kans. C. I. Stocking,
Supt., Northwest Kansas Telephone Co.

Reducing the Time of Calls.

Recently a long railway tunnel was bored under the Hudson River to enable trains of the Pennsylvania Railway to enter New York City from Jersey City, which had been the terminal point. It would have taken years to construct this tunnel working from one end only, so, realizing this fact the engineers in charge adopted the plan of working from both ends simultaneously and connecting the two bores in the middle. In the telephone industry a similar condition exists and so far the work has been done from one end only, although some telephone companies have started work on the other end.

Telephone engineers since the first successful exchange was installed, have been at work with almost the sole aim of reducing the time required for completing a connection. The apparatus has been perfected, improved and the demands in large cities have resulted in the development of the trunking system, while schools are maintained by the larger companies for the training of operators. The automatic ringing machine enables the operator to ring a subscriber by touching a key lever instead of turning a crank and even where code rings are used, systems have been devised to cut down the actual length of a ring at a subscriber's telephone to a minimum.

In the face of all these very important developments, most subscribers still answer a call with, "Hello!"—just as was done thirty years ago. This answer necessarily calls for the introduction of a question, such as, "Who is this?" or "Is this the Jones company?" and a reply to one of these or other questions before the two connected parties overcome the customary preliminary formalities of a telephone conversation, thus losing much time.

How much more could be done toward accomplishing the desire of the telephone people, if the managers would endeavor to educate their subscribers to discard the word "Hello," and answer instead with either their name or telephone number; if all the instruction cards directing the party, answering the telephone, to take the receiver off the hook, hold it to the ear and say "Hello" were thrown away and a new set of instructions printed containing up-to-date directions; if telephone companies would use just a little more ingenuity in selecting telephone exchange names and numbers so as to make them shorter and more simple, as, for example, "Branch 25" or "Exchange 25," instead of "Private Branch Exchange 25."

If it were not for the fact that any efforts made along these lines would really make an appreciable impression on the treasury of the company, one might consider the idea less seriously, but with the actual time of a call reduced from 15 per cent to 25 per cent, it means fewer busy signals, more calls and more satisfaction, all of which contribute to increase the telephone company's income.

Chicago. W. J. Miskella.

British Telephone News

Wireless Telephony from a Moving Train—Essential Characteristics—Further Anglo-French Telephone Submarine Cables—Telephoning Telegrams—World's Greatest Telephone Exchange.

By Abercrombie

For the first time in this country, wireless telephony from a moving train was accomplished on July 26, upon a stretch of railway line between London and Brighton. Traveling by fast train, a railway official spoke to an inspector in a signal-box as clearly and easily as if the train had been stationary and connected by wire with the box. Henry von Kramer the inventor who conducted the experiment, is an electrical engineer, trained at Munich, and now engaged in business at Birmingham. For four years he has been working out the system in his private workshop. For the purpose of the experiment a double line of wire was laid along the sleepers between Horley and Three Bridges. One telephone was placed in the brake van of the 2:30 p. m. train from London Bridge, the other was in the signal-box at Three Bridges. As the train entered the circuit at Horley, Mr. von Kramer placed the receivers to his ears and a conversation took place while the train was running at forty miles an hour.

Mr. von Kramer explains that the invention is an improvement upon something which has been tried before and failed. The great difficulty was to get rid of the induction of the telegraph wires along the side of the railway. "By placing a band or bridge or wire completely round the carriage, I have succeeded in cutting out all interference, and the system can now be extended to any length of line, no matter how many wires there may be in the neighborhood. The system can be installed for less than $50 a mile."

The fact which it is alleged distinguishes Mr. von Kramer's system from any other previously tried in England or America, is that there is no contact by brush between the moving train and the stationary wires. The electric impulses travel between the "bridge" on the carriage and ground wires through an open-air space of eighteen inches.

Subject to the consent of the General Post Office, which holds the telephone monoply, the Brighton railway will install the Kramer system of telephoning from a moving train, on the line between Brighton and London next winter. "I shall give it a trial next December," said William Forbes, manager of the railway, at the opening of the Brighton season. "The instrument will be placed in the Southern Belle express, and people who are traveling between London and Brighton, either way, in that train will be able to send and receive messages. I have not yet had time to go into the question of the value of the system for purely railway purposes, such as communication between trains and signal-boxes in time of fog. If it is an improvement upon our present methods it must in time be adopted."

The essential part of Mr. von Kramer's invention is a frame of wire, encircling the carriage in which the telephone instrument is placed. The ends of the frame are connected with the instrument. From the low portion of this frame the magnetic electric waves pass to the "stationary circuit," consisting of two wires, on the down and up lines. These wires enter the signal box and connect with the signalman's instrument which can in turn be switched on to the ordinary telephone wires along the side of the track. The message is transferred by induction from the train to the stationary ground wires, no matter at what speed the train is moving.

Mr. von Kramer is now working upon a simple adaptation of this system by which it will be possible to telephone without wires from room to room in a house, moving the instruments about at will.

Readers of "TELEPHONY" are aware that a submarine telephone cable of a novel type was recently laid across the English Channel from Dover to Cape Grisnez by the British Post Office in order to improve telephonic communication between this country and France, and also determine the limits of possible improvement by the use of the new type with a view to its application to telephonic communication between places which have hitherto been beyond telephonic range. This is the first cable of the kind laid in tidal waters and across the open sea, although a similar cable was previously laid in the Lake of Constance. The new cable will be brought into regular use as soon as the corresponding French land lines are completed, but the tests so far made have given very satisfactory results.

The French Government proposes to lay a second new cable across the Channel, and it will thus be possible to provide for the increased traffic likely to result from the reduction of charges for conversations between England and France which will then take effect. In the meantime it is proposed to use the new English cable for experiments in conversation between London and Amsterdam, and possibly Berlin, and other cities in Germany. Hitherto such conversation has been prevented by the difficulties involved in the use of submarine cables of great length, and the only Continental country besides France at present in telephonic communication with Great Britain is Belgium. There is, however, a large and real demand for telephonic communication of this kind with Holland and Germany, and it is satisfactory to think that such a service may be practicable at no very distant date.

A new submarine cable has now been laid down between Waterville, Ireland and Weston-super-Mare, certain sections of it have been made especially heavy owing to the destructive effect on the earlier cables of fishing trawlers.

Sir Matthew Nathan, Secretary of the General Post Office, has issued to subscribers to the Post Office telephone service system the following communication: "I am directed to inform you that the Postmaster General is desirous of substituting delivery of telegrams by telephone for delivery by boy messenger, and that this method is now being adopted experimentally in the case of telephone subscribers whose telegrams are ordinarily sent to them from the—Post Office. Delivery is quicker by telephone than by mesenger, and where attention cannot be obtained at once by telephone, the message is sent out in the usual way by hand. In every case of telephone delivery the written telegram is forwarded by post. Unless you notify to the contrary the Postmaster General will assume that he will receive your co-operation in the experiment."

The announcement made by the Post Office is the result of an experiment which has been tried in several centers in London. I am informed that if the experiment is found to be successful the intention is to make it apply not only to London, but to a large number of provincial centers. The idea is not only to expedite delivery but to reduce the number of boys, for whom the Post Office finds a difficulty in providing permanent situations when they grow up. Roughly there are about 2,700 boys employed in delivering messages throughout London. When the entire telephone system passes into the hands of the Post Office it will not only be possible for the residents of towns to take advantage of the system, but the benefit may be even greater to those living in remote parts of the country where telegrams are now sent from head

offices to small outlying country offices, three or four miles distant it may be, for delivery.

With an efficient telephone exchange system these telegrams assuming that the public fall in with the arrangement will be spoken direct from the head office of the district to the office of the addressee. There are other ways in which the new system may become of great value. The majority of the offices in Great Britain are closed from 8 p. m. until 8 a. m., but those who are telephone subscribers will be able to have their messages delivered to them and to reply to them during the night hours. Hitherto telegrams have been telephoned on an application being received from the addressee, but under the new management, the sender will get the advantage of delivery to telephone without having previously made application for it. Special precautions will be taken to ensure the correct delivery of telegrams by telephone. In every case the written message will be forwarded by mail.

The greatest telephone exchange in the world has just been opened in Hamburg. All the telephone systems of Hamburg, hitherto operated from five centers, are now united in one central exchange.

40,000 lines are equipped, and the staff includes 1,500 male and female officials. This huge exchange is worked on the call distributing system.

The Legal Side

By A. H. McMillan

Illegal House Moving.

Will you please tell me through your paper whether or not a party has the right to move a building through the streets in a city and tear down all of the telephone wires and make the telephone company put them up again at the company's expense? One of the streets is a township line, but it is an incroporated town.

The use of a street for moving houses is an extraordinary one and while it may be permitted, it cannot be allowed to destroy the use of the streets for travel or necessary public purposes. No such use of the street can be made to the impairment of the vested rights of a telephone company. In the case you state, you have the right to require the house mover to pay the expenses or to desist from his undertaking. You may even require him to give you a bond beforehand to protect you against expenses and possible damages, and if he does not comply with your request you are entitled to an injunction to restrain him from proceeding. N. W. Tel. Exchange Co. vs. Anderson, 98 N. W., 706; Frontier Tel. Co. vs. Hepp, 121 N. Y. S., 460; Nagle vs. Hake, 101 N. W., 409; McMillan on Telephone Law, Sec. 240.

Bond Issues.

Our officials have been thinking very strongly of making some very substantial improvements in our plant and increasing it to about three times its present capacity. This will require considerably more money than is at our disposal, so we will have to make a bond issue. As one of your subscribers, I am writing to you to ask how and with whom we should first take up the matter. Of course, I understand there will be a statement of the company's position, etc., to be rendered, but that will come later if anything is done or about to be done.

The steps to be taken in obtaining a bond issue depend, in a considerable degree, upon the size of the issue and the manner in which you wish to dispose of your bonds. The bonds may be underwritten by some large bonding house, providing you can secure one that is willing to do it upon terms satisfactory to yourselves, and the whole issue disposed of to them, or you can dispose of the bonds yourselves. Your bonds should be secured by a mortgage upon your entire plant and assets and for this purpose a trustee or trustees will be necessary. If you can get a trust company to underwrite the bonds, that is to take the whole issue at a certain price, such trust company would undoubtedly wish to be the trustee in the mortgage. If you expect to dispose of the bonds yourselves, you could have some well known citizen or citizens act in the trust capacity, or you could, in this case also, use a trust company as trustee. A corporate trustee is better because practically continuous. In other words, the trusteeship would not run the risk of being disturbed by death. As a rule, too, bond buyers have more confidence in a trust company as trustee than in individuals. Having made up your mind whom you want for trustee, the next logical step is to prepare your mortgage and bonds. It is not necessary, of course, to have the bonds printed at this stage, but it is desirable to have the form of mortgage and form of bond drafted. You are then in a position to negotiate with possible purchasers and to place some bonds in advance of their issue. Having tentatively placed enough bonds to be sure of the success of their issue, your next proceedings should be to have your mortgage authorized by stockholders and directors and executed in accordance with law, the bonds also being prepared and signed. You are then in position to dispose of your bonds to the general public or other purchasers. The provisions of the mortgage would also provide some of the steps to be taken in making the issue.

Baltimore Laws Do Not Apply to Companies with State Franchises.

The Circuit Court at Towson, Md., has overruled the demurrer of the Baltimore County Commissioners to the petition of the American Telephone & Telegraph Company for a writ of mandamus to require the commissioners to grant it a permit to lay a conduit on the Philadelphia road.

The commissioners contended that before the telephone company could secure the permit, it must comply with the provisions of the local law, which require that applications for franchises for the use of roads in Baltimore county should be advertised and the County Commissioners have the right to charge a money compensation for such franchise.

The court held that as the telephone company secured its right to use the public roads of the state from the legislature, the local law referred to did not apply to the telephone company, but that the law did apply to all franchises granted by the county commissioners.

Injury to Lineman by Street Railway.

A telephone lineman was climbing a pole, having upon his arm a coil of rope. A rapidly moving electric railway car becoming entangled in the coil of rope, dragged the lineman from the pole. In falling he struck a fence and landed across a car rail, sustaining a broken leg and other injuries. There was evidence that the car ran at a speed of from 30 to 35 miles an hour; that the rope, ½-in. in diameter, was 60 ft. long and had been coiled at the foot of a telephone pole about 7 ft. from the track. There was also evidence that the suction of the car carried the rope to the track where it became entangled with the car. The evidence, however, was held to be insufficient to establish liability against the railway company. Johnson vs. Wilmington City Ry. Co., 65 Atlantic, 961.

A Chinese Telephone Exchange in San Francisco.

On account of the large number of Chinese on the Pacific Coast and especially in California, the Pacific Telephone & Telegraph Company established, a number of years ago, a Chinese exchange in San Francisco. The old exchange was completely destroyed in the disaster of April, 1906, and has been recently replaced by a very handsome structure.

In architecture, it is strictly Oriental in character, every detail having been carefully worked out through advice from the members of the Six Companies and other prominent Chinese merchants. The structure has three pagodas along the lines of palaces in China, where the number of roofs designate the importance of the owner. In China these roofs also protect the interior from extreme heat or cold. The interior is also strictly Oriental, the woodwork being of rough-cut material, finished in ebony.

The switchboard is designed to take care of 3,500 subscribers.

The exchange is under the management of an American-born Chinese, Mr. Loo Kum Shu, and the operators are Chinese girls. Although the directory contains the names of the subscribers in both English and Chinese and numbers assigned them, nevertheless the subscribers invariably give the operators the name of the party desired, rather than the number.

As this exchange has connected at present about 1,000 subscribers, it will be readily understood how difficult is the task before the Chinese operators. Yet all calls are handled with the same dispatch and accuracy as in exchanges containing American operators where numbers only are used. It is necessary, of course, for operators to be able to speak both the Chinese and English languages fluently.

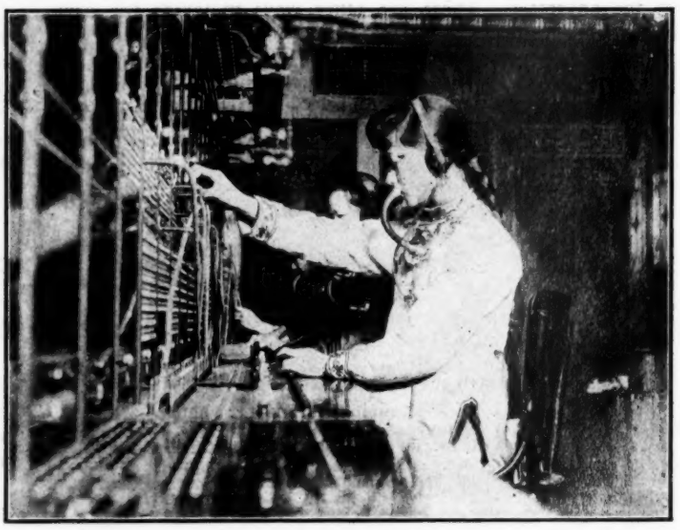
The Chinese subscribers, as a rule, demand individual lines and are very heavy patrons of toll lines; in fact, they prefer long distance telephony to all other forms of correspondence. Furthermore, the Chinese merchant is unusually prompt in the settlement of all accounts and very reasonable in all of his dealings with the telephone company.

This exchange is probably the only one of its kind in the United States, and the illustrations indicate its truly Oriental character.

The basement of the building contains the cable rack and the other apparatus usually placed outside the switchboard.

The energy for this exchange is obtained from eleven cells, Type E-11 "Chloride Accumulator," manufactured by the Electric Storage Battery Company. The battery is charged by means of a 30-ampere mercury arc rectifier.

The illustrations showing the interesting characteristics of this unique exchange are provided through the courtesy of the *Western Electrician and Electrical Review*. It has attracted attention from all parts of the world and was instrumental in influencing the Chinese Government to adopt the telephone.



The Chinese Operators at the Switchboard Which Serves Chinatown in San Francisco.

Exterior View of the Chinese Telephone Exchange.

Interior View in Telephone Exchange in San Francisco's Chinese Quarter.

The Home Service at St. Joseph.

TELEPHONY has just received from Mr. Buford Adams, representative of president Theadore Gary, in active charge of the Home telephone system, St. Joseph, Missouri, one of the cards used to keep the city posted on the growth of the Home system. For his convenience, each new subscriber is furnished with a number of these postal cards, carrying on one side the space for address and legend, "I have installed the Home Telephone Service. Call me on the Home number ——" The other side carries engravings of the main exchange of the Home Telephone Company, which has been previously described in the columns of TELEPHONY, and is one of the model telephone buildings of the country; also of the new South Exchange, which as a branch office takes care of a district somewhat remote from the telephone center of the town.

Queries on Theory and Practice

Trouble Ringing Switchboard Over Line with Bridged Stations.

We had two 14-gage grounded circuits twelve miles long, connected to a switchboard at each end. It was no trouble for one office to signal the other, or any of the telephones, but the lines were so noisy we changed them to a metallic circuit and connected them to the switchboards through repeating coils. And then our trouble began. There are eleven 1,600 ohm bridging telephones on the line, and we have no trouble getting the one farthest away from either office, which is 9 miles, but one switchboard will not throw the drop on the other. Now, what I would like to know through your paper is, will a grounded circuit carry a ringing current farther than a metallic, or where is my trouble?

The condition which you describe is shown in Fig. 1. Your trouble evidently comes from one of two sources. Your source

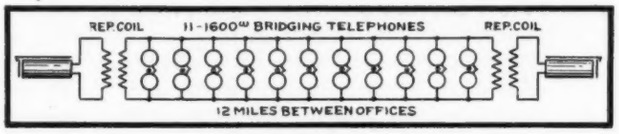


Fig. 1.

of ringing current may be a little too weak, or the repeating coils may not have high enough efficiency.

No matter how well made the repeating coil may be, some loss in it will exist. It is very likely that your pole changer or other generator gave only enough power to ring the line directly. The insertion of the two repeating coils with their losses is just enough to prevent the throwing of the drop on the distant switchboard.

Your repeating coils are doubtless all right, for if not, you could not ring the eleven telephones through one of them. Your best course is to increase the voltage and the power of your ringing generator.

Why Ringing Sometimes Closes Bad Joint.

Why will a ring-back sometimes clear up a line that sounds dead?

A line which sounds dead is one which is open. When you speak into the transmitter of a telephone which is attached to a closed circuit, the talking current generated passes through your own receiver; hence you hear your own voice, and this constitutes the "live" sound which is evidence of a closed circuit. If the line is broken from any cause, little or no current can pass through your receiver, hence the user misses the usual "side tone" and refers to the telephone as "dead."

If the line is open because of a corroded joint the following condition exists: When the joint was made the two wires were in close contact, so that current could easily pass from one to the other. Being exposed to the atmosphere and weather, a coating of oxide began at once to form on the exposed surfaces of the wire. In time this oxide crept along the surface to the region of contact. On account of the pressure with which the wires are held together, the film of oxide between the two surfaces is very thin. Finally the last spot of contact is separated by the film of oxide, and the circuit is broken.

The voltage of ringing current is much higher than that of talking current, hence the former is often able to jump through the thin film of oxide at the point last attached, and in a small way to fuse the two wires together. This gives contact and allows conversation to proceed for a few hours or days longer, but as the forces of nature continue their work, the coat of oxide again penetrates between the wires and cuts off the service. Sometimes a bad joint can be "closed" by ringing several times in succession, but eventually it gets so bad that it will not respond to this treatment and the joint is permanently open. It will have to be located by the troubleman and remedied

This trouble occurs most frequently with joints of copper to galvanized iron which are not soldered, though an iron-to-iron (both galvanized) joint may suffer if not made with sufficient pressure.

A joint properly made and thoroughly soldered never acts in that way.

Does Lightning Hurt Telephone Batteries?

We had a telephone put out by lightning in a very peculiar way. The fuses were out and a test showed that the transmitter was out. An examination showed that the wire which runs from the binding post to the carbon chamber had been fused. The telephone was found to be O. K. in every other respect. The batteries were found to be eaten through, however, and had to be replaced.

Now, what I would like to know is this: Does lightning affect the batteries? If the current is strong enough in the battery circuit to fuse the transmitter wire, isn't it strong enough to injure the batteries? I change more batteries in rainy weather than at any other time. Is this due to lightning or to moisture in the air? If lightning does affect the life of a battery would a person get the maximum of efficiency out of a battery by installing it in the fall of the year?

Since the line is metallic but had no lightning arrester at this telephone, the discharge must have come in on one wire, through the telephone, out on the other wire and to earth at some point. Since we assume that the receiver was on the hook at the time, the lightning must have jumped from one conductor to another at some point in the instrument. Different manufacturers arrange the wires in various ways, so that it sometimes occurs that a discharge can jump across where the telephone current would not go. However, in most cases the hook switch is the only place where the conductors come close enough together for this. If the rubber insulation between the springs gets dusty and then damp weather comes on, you will have a certain amount of leakage at this point, and lightning may jump across, as arrowed in Fig. 2.

The writer was recently shown two dry cells each of which had a hole in the side said to have been caused by lightning. It is doubtful if the one sudden discharge is responsible for exhausting the cells. It is more likely that if the cells touch each other, part of the current jumps from one zinc case to the other, opens a hole in each, and thus allows the cell to run down of its own accord.

Rainy weather affects the life of dry cells chiefly by lowering the insulation of the circuit inside the telephone so that a small current is constantly drawn from the battery. This runs it down. If the interior wiring is properly done the only chance

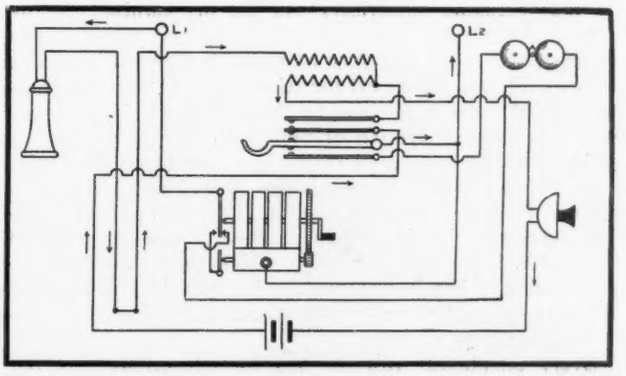


Fig. 2.

for leakage is across the insulation between the springs of the hook switch. Clean the dust off thoroughly with a rag dampened in gasolene. Keep the two cells separated in the box, and do not let them rest against any wires. This will maintain your insulation and the time of year when you change the battery will not make much difference to the life.

The Cost of Production.*

By Morton Purdue.

This is a subject of like interest to everyone employing labor, and using material in turning out a manufactured product or furnishing a commodity or a service to the public. It must never be lost sight of while we are busy with service, collections, construction, or what-not, for if the cost of furnishing service exceeds a certain percentage of the gross earnings, our other efforts toward success are unavailing.

The usual items of productive labor, non-productive labor, selling expense, fixed charges, etc., as used in factory practice are applicable in a certain sense to our own business, and, while manufacturing concerns use the finished product as a unit from which to calculate cost, profit, etc., we, in turn, may use the "service per telephone furnished" as our unit. This may be computed on a daily basis if desired, but once a month is often enough, as expense accounts are usually closed every month.

We have all noted in our trade journals the various articles on classifications of accounts, wherein earnings are separated into rental, toll, miscellaneous, etc., and expenses classified into service, maintenance, and general expense.

There are other things which are factors in the cost of service, such as taxes, interest and depreciation, but taxes and interest are matters beyond our control and it is not the province of this paper to discuss the item of depreciation. We must arbitrarily fix a figure for depreciation in order that the entire cost may be had.

The profit in a business is the real measure of its success. The profit is obviously the difference between the selling price and the total cost of production, or, in our own cases, the profit which may be applied to dividends is the money which is left after all expenses and fixed charges and depreciation are deducted from the gross earnings.

The great importance of classifying earnings and expenses is apparent when it is the purpose to analyze an expense account and to discover and stop the leaks, or to arrive at a profitable rate at which to sell the service.

Whatever system of classification of accounts is adopted the book of record or voucher register is a valuable adjunct. It is preferably ruled to show the divisions and subdivisions of revenue and expense. All transactions having been entered in their proper columns, the summary at the end of the month will be a record of the total earnings and expenses for that month.

But to return to the idea of the unit as advanced above, and its advantages if there be any; suppose we have a plant of four thousand subscribers and the net earnings are five dollars per telephone per year. We add one thousand subscribers and total earnings increase, but the unit system shows only four dollars net per telephone. Another one thousand added reduces the net to three dollars. We can see that it is only a question of time until our increase in expense will offset, or more than offset, our increase in earnings, and we must refuse additional business which is in the end fatal, decrease our expense, or raise the rates. The unit system of figuring expense, when carried along month by month, is an unfailing index which shows not only the total increase, but just where the increase is, and the remedy may be applied before the annual statement stares one in the face with a deficit.

Every telephone, with the possible exceptions of extensions and private branch exchange stations, which may be considered as by-products, should show a profit; in other words, should pay part of the dividend; and, while the average earnings per telephone per year may be twenty dollars, and the average cost of furnishing service per telephone is fourteen dollars, any telephone that does not earn something over fourteen dollars, say the twelve dollar party line telephones, should either be cut out or the rates increased to over fourteen dollars in order that the manifest injustice of Mr. Smith's telephone at twenty-four dollars, paying his expenses and also helping to pay the expenses of Mr. Jones's twelve dollar telephone, may not arise.

If we were operating a factory, we would not continue to manufacture an article upon which there was a loss, but would either discontinue it, or make it profitable by increasing its selling price, or decreasing the expense of its production. We are in a sense operating a factory and the same applies to us.

My experience has been that after an exchange has been in operation several years, and is furnishing party line service, all the business houses and other high price telephones having been connected during the first years, the average gross earnings per telephone are liable to decrease by reason of taking on the cheaper, party line, residence service. This is not in itself a serious matter as long as the net earnings per telephone can be made to show an increase. This can sometimes be done by a more efficient organization of employes, more economy in the use of maintenance supplies, the proper distribution of operating force, and in other ways that will come to mind.

Here is where the voucher register plays heavily, as we can "back track" any item of expense and perhaps reduce it in the following month. As a matter of fact, the plan followed by municipal governments, whereby certain appropriations for every item of expense are made, can be followed. We have all found, personally at least, that when we don't have the money we don't spend it. This principle may be applied in the daily routine of our respective exchanges, always keeping in mind, however, that there is such a thing as false economy in expenditures, especially in maintenance.

To revert once more to the unit principle, it is customary to take the number of telephones in service at the first of a month, and the number in service at the last of the month and add them and divide by two to get the average number in service for the month, which is the number used in all the calculations.

Figures are more interesting to some of us than to others, but you will be surprised at the vast interest you will take in watching the record month by month and seeing the fluctuations per telephone of earnings and expenses, just how much every telephone is earning gross and net, etc., in case such a record is started.

*Abstract of a paper read at the Practical Conference, convention of the Ohio Independent Telephone Association.

Missouri Tax Values.

Taxes on telephone property in Missouri have been assessed on the basis of a total valuation of $8,075,761.25 by the state board of equalization. Among the properties covered are the following:

Bell Telephone Company, of Missouri, $2,999,932.97; Missouri and Kansas Telephone Company, $1,497,478.49; Kansas City Home Telephone Company, $1,000,000; Kansas City Long Distance Telephone Company, $100,000; Kinloch Telephone Company, $598,945; Kinloch Long Distance Tel. Co., $184,400.

Ohio Companies Fear New 33,000-Volt Power Transmission Line.

A new high tension power line, to carry current at 33,000 volts pressure, is likely to give trouble on the systems of certain Ohio telephone companies. A dispatch from Dayton says that the county commissioners have been asked to take such action as will safeguard, as far as possible, the interests of the telephone companies. Such action has been requested by officers of the Home Telephone Company of Brookville, the Home Telephone Company of West Milton, the Home Company of New Lebanon.

Here and There

Tax Values Likely to Be Raised in Ohio.

Radical changes are promised in the valuations of the various telephone companies of Ohio by the Ohio State Tax Commission, which has taken up the work of listing many of the public utilities of the state. The tax commission has given out a statement in which it is proposed to double and in some cases treble the taxation value of the telephone properties of the state. The increase is to be made on both the Independents and Bell companies.

While the values have not been finally placed, tentative values have been fixed and all corporations interested have been notified of the intention to advance the taxation value and given an opportunity to appear before the taxation commission to oppose the increases. It is believed some lively times will take place at the hearings.

For the Columbus Citizens Telephone Company, President Frank A. Davis, Attorney D. J. Cable, of Lima, and Attorney W. L. Cary, of Columbus, will appear. The same attorneys will appear for a number of other Morgan properties in the state.

Attorney W. L. Cary said: "The plan to increase the taxation value of Independent telephone properties to such an extent will be opposed. The tax commission only took up the work recently, and before it began operations railroads rushed in to have their taxable value fixed by the old method. Thus they were not increased to a large extent, as the tax commission proposes to do in this case. We only want justice in the matter."

The statement of the tax commission follows:

"The Columbus Citizens Telephone Co., which, according to information bruited about at the time of its sale to the Morgan interests, has a capital of $1,552,100 and $650,000 in bonds, and whose preferred stock sold at par to the Morgan interests and its common stock at 97½ cents (the 2½ cents representing the brokers' commission), was on by the old state board at $424,947. The commission will increase this figure in the neighborhood of $1,000,000.

"The Dayton Home Telephone Co., which was on for $199,355 in 1909, has been valued at something over $500,000 by the commission.

"The Franklin County Telephone Co. was on for $67,600 last year. The commission has substantially doubled that figure.

"The Hamilton Home Telephone Co., which was on for $63,000 last year, is on for more than double that amount this year, according to the commission's tentative valuation.

"The Central District & Printing Telegraph Co., of Pittsburg, on for $368,668 last year, has been increased to about $700,000.

"The Cuyahoga Telephone Co. was on for $972,121 in 1909. The company has fixed a tentative value of more than $2,000,000. Such stock of the company as was sold would indicate the value of the stock $1,189,880, and in addition has outstanding $2,708,000 in bonds, as was stated at the time of the sale.

"The United States Long Distance company has a stock value of $2,116,000, at the way it was selling last year, and, in addition, has outstandng $2,156,000 in bonds. This company was on the duplicate for $604,017. The commission has raised that something over $1,300,000.

"The Cleveland Telephone Company, which was on for $1,520,777 in 1909, is on for something near $3,000,000, according to the commission's tentative valuation.

"The Youngstown company had been paying taxes on $87,270 valuation. The commission is putting it on at more than $200,000.

"After the valuations have been definitely fixed, the tax commission certifies them to the county auditor, together with the distrbution of the valuations through the taxing districts through which these telephone lines pass.

"For example, the Central Union Telephone Company paid in 1909 on a valuation of $3,677,000. This year the commission has added nearly $2,000,000 to the tax value of that company. The lines of this company run into nearly every county in the state. The commission takes the mileage in each county and distributes it through the taxing districts in the county through which the line passes, and then distributes the value represented in that county through the taxing districts, pro rata, according to the number of miles of lines passing through such taxing districts.

"The reports of telephone companies, on which the commission was obliged to base its valuation, were made to the old board, consisting of state officers. These reports were incomplete in form. The information contained in the reports was, therefore, of an incomplete character, even when all of the questions were answered."

The old board went out of existence July 1, so far as this work was concerned, without having done anything with the reports. In fixing the valuations the commission has taken into account all of the information it could obtain from the reports and from any other available sources. It has fixed tentative values, and has notified the telephone companies of the tentative values fixed and of their opportunity to be heard.

Attorney General of Nebraska Questions Bell Officials.

At a hearing before Attorney General Thompson of Nebraska, on Aug. 26, George E. McFarland, general manager of the Nebraska Telephone Co., a Bell organization, admitted that his company had purchased outright or acquired a controlling interest in competitive telephone companies.

Attorney General Thompson is being assisted in his examination of the Bell officials in these anti-trust proceedings by Judge Allen W. Field of Lincoln. Frank H. Woods, president of the National Independent Telephone Association was also present at the hearings.

In his testimony Mr. McFarland admitted that his company had purchased a controlling interest in the Independent companies at Ravenna, Alliance, Broken Bow, Wayne, and in Phelps county. He admitted that only a prefunctory appraisal of the physical values of the plants mentioned had been made before the purchase. The witness testified that his company had the policy in all its negotiations of acquiring a controlling interest in the small companies or none at all.

"What is the reasons for this procedure," queried Attorney General Thompson.

"Why it's a poor investment to take a minority holding in anything," was the answer.

"Didn't your company desire to get control of the operation of the companies absorbed?"

"It wanted the controlling interest."

"As a business man, don't you think the object was to control the business?"

"As a business man I think that is the only conclusion," admitted Mr. McFarland.

New England Telephone Company Adopts Highway Commission Rates.

Rates recommended by the Massachusetts Highway Commission for the Boston and suburban district will go into effect, for all new contracts, Nov. 1, 1910. The directors of the New England Tel. & Tel. Co., voted for their adoption, and on Aug. 30, President J. N. Keller notified the commission that they would be put in force. In this letter he said:

"Certain features of the proposed plan are new and it is somewhat difficult to foresee just what they may lead to or just

what they may seem to establish in the way of precedents. In view of the fact that the company's objections are based more upon this uncertainty that upon any demonstrable conviction that the plan may prove to be unfairly burdensome, the company has decided to give the entire plan a complete and impartial trial.

"This decision of the company is upon the assumption that its action is without prejudice and that experience may show the necessity for modifications or readjustments.

"It is impossible to state at this time when the new rates can properly be put into effect. It is clear that many of the existing rates must remain for at least six months or a year. Meanwhile the company will make every effort to begin to furnish service under the new rates, to those who desire it, by Nov. 1."

A New Means of Advertising.

A most unique method of advertising a public service corporation's business is that practiced by the Citizens Telephone Company of Grand Rapids, Mich. It consists in placing boxes containing the latest telephone directory published by the Citizens company, at the principal downtown street corners of the city. This directory is for the use of the corner policemen. The outside of the box is very plainly lettered to show that the box is owned by the telephone company and the purpose for which it is to be used.

The telephone company received its first inkling of the value of such an arrangment when two of the corner policemen had a box made and placed in it the directories of the two telephone companies. Previous to this time it had been the practice of the officers to use the telephone directories, but they were carried about by the men or hung out in the

Another Method of Advertising the Telephone Directory Boxes of the Grand Rapids Company.

air to become weather beaten and torn. Some of the officers had kept their books in the waste paper cans which are placed about the city and had dug down among the paper for the directory whenever information was wanted.

The telephone company knew nothing of the fact that its books were being used by the corner policemen until notified by the boys, who delivered the directories, that the officers wanted copies. The company investigated and the general manager saw a chance for the best of advertising, which would cost almost nothing, and would be sanctioned by the city officials.

Later permission was secured from the police board to place the boxes on poles at the corners where policemen are stationed. The boxes were made and are now in place at every downtown corner. They are about 14 inches long and about the same in width. The pushing of a button opens the box and the telephone book is at hand for the use of the patrolman in answering queries. On the front of the black box appears the name of the telephone company lettered in white, as shown in the illustration.

Indianapolis Telephone Case Dismissed From Courts.

The suit brought in 1908 in the name of the state of Indiana, on relation of Elliott R. Hooton, prosecuting attorney, against the New and Indianapolis telephone companies to annul the lease of the former to the latter company, to place the companies in the hands of a receiver and to restrain the companies from entering into a new franchise contract with the city of Indianapolis, has been dismissed on appeal in supreme court by John W. Holtzman, one of the attorneys who was associated with Mr. Hooton in the case.

The suit was brought in the circuit court mainly for the purpose of preventing the consummation of the franchise contract involving a raise in rates, and was taken to Boone county on a change of venue. The Boone circuit court decided against the state on demurrer, and an appeal to the surpreme court was taken by Prosecutor Hooton and his associate counsel. Meanwhile, the city council had granted the franchise contract in question.

Prosecutor Hooton expressed surprise that the appeal had been dismissed and said he had not been consulted about it, and did not authorize the dismissal.

There has been one increase in rates made by the Indianapolis Telephone Company, since the new franchise contract was entered into. It was made in July 1909, before the appeal was taken. The rate for business service was advanced from $40 to $54, the same as the Bell company had been charging previously. No further increases are now contemplated, according to William Fortune, president of the company.

Another appeal in a similar case, the suit of A. W. Hatch against the New and Indianapolis telephone companies, was also dismissed in supreme court.

Baltimore Subscribers Protest Against Proposed Measured Rate.

Business houses in Baltimore, Md., who are large users of telephone service are protesting to the Public Service Commission of Maryland and the newspapers against a proposed readjustment of telephone rates which will mean an expansion of measured service. Apparently the absence of competition since the Maryland Telephone Company was purchased by its competitor is causing the business firms to take the attitude that they are being dealt with in a high handed way. For example, the Baltimore branch of the banking house of Van Schaick & Company, New York, has addressed to the Board of Public Utilities, a letter in which it says, "The telephone company has the people of Baltimore just where it wanted them. With the Maryland Company forced from the field of competition, the Chesapeake and Potomac Telephone Company has been very arbitrary in dealing with subscribers."

Other objectors who are already using the measured service mention disagreements between records of calls kept by themselves and those kept by the telephone company.

J. G. Ihmsen Retires

Telephone men will learn with regret of the resignation of Mr. J. G. Ihmsen, secretary, assistant treasurer and general manager of the American Electric Telephone Company, Chicago, which took effect September 1, 1910. Mr. Ihmsen had been contemplating this step for some time in order to give his entire attention to his personal interests which have grown to considerable proportions.

Mr. Ihmsen is one of the pioneers in the telephone field being one of the first four men to enter the Independent telephone manufacturing business. In association with Mr. B. G. Hubbell, who is now the president of the Federal telephone company of Buffalo, which controls the Independent telephone operating business of western New York, he formed the Keystone Telephone Company of Pittsburg in 1894. Coincident with Mr. Ihmsen's entry into the telephone manufacturing field Messrs. P. C. Burns and J. E. Keelyn started telephone factories in the West. These four men were the pioneers in the industry which has grown to enormous proportions, the investment in manufacturing and operating companies being something over half a billion dollars.

Mr. J. G. Ihmsen

Mr. Ihmsen was born in Pittsburg, Pa., February 1, 1872, and engaged first in the glass business, entering his father's firm of Charles T. Ihmsen & Sons. This company was the successor to Christian Ihmsen, Mr. Ihmsen's grandfather, who established the first glass factory west of the Allegheny Mountains and which company was continuously the leader in this industry from 1812 until absorbed by the United States Glass Company. Mr. Ihmsen, being a junior member of the firm, struck out for himself after four years experience in the glass manufacturing business, forming in association with Mr. Hubbell, the Keystone company, to manufacture Independent telephone apparatus. The Keystone company was one of the most prominent manufacturing concerns in the field and in August 1898 a consolidation was effected between the American Electric Telephone Company, the Keystone Telephone Company, and the Northwestern Telephone Equipment Company, under the name of the American Electric Telephone Company, of which Mr. P. C. Burns was and still is the president. Mr. Ihmsen took the active management of the consolidated companies. As general manager of the new company it devolved upon Mr. Ihmsen to handle the closing of practically all the contracts for large common battery systems which were installed in about thirty-five cities throughout the country.

In the early days the telephone manufacturing business was a strenuous one. When the Keystone company was organized the Bell company had a monopoly in both the manufacturing and the operating ends of the industry. It devolved upon Messrs. Ihmsen and Hubbell not only to develop a complete line of telephone equipment, but to create a market as well. This made it necessary for Mr. Ihmsen to secure franchises from towns and cities, and organize promoting companies, while Mr. Hubbell took care of the manufacturing end.

For sixteen years Mr. Ihmsen has been prominent in the telephone manufacturing business having held the position of president of the Independent Telephone Manufacturers' Association from its inception to the present time. He has also been an enthusiastic worker for the upbuilding of both the National Independent Telephone Association and the different State associations, giving freely of his time and money to make the conventions successful. He has served on prominent committees in connection with Association work for the past ten years. From the time of the first convention at Detroit he has been a prominent figure and worker in National and State Conventions.

He comes from one of the oldest families in Pittsburg—one which has been identified with the progress and building of the "Smoky City." Few indeed are the men who have had an opportunity to gain so wide an experience in the telephone business as Mr. Ihmsen, or of employing the qualities of leadership in so many phases of this complex industry. Starting in with the promotion of telephone companies, he has had charge, successively, of sales, contract, auditing and manufacturing departments, and an executive experience of many years.

Mr. Ihmsen came to Chicago in March 1900 and has since made that city his home. He is a member of the prominent clubs and is well known in business and social circles. Being a believer in the future of Chicago, he is a large holder of Chicago real estate. Mr. Ihmsen has many friends throughout the telephone field who will be sorry to lose an old time friend and co-worker.

Meeting of Independents Around Austin, Tex.

A meeting of representatives from a large number of Independent telephone companies in the territory around Austin, Tex., was held August 30, in that city, for the purpose of getting the telephone companies in closer touch with one another and improving the service. The United Telephone Company of Austin, which has connection with most of the surrounding rural exchanges, serving about 700 farm patrons, was chiefly instrumental in calling the meeting. Two sessions were held, and it was decided to hold similar meetings every three or four months, in order to keep in close touch with the work and improvements being carried on by the exchanges. After the meetings, a banquet attended by all those present was held at the Hancock Hotel. The Independent telephone men attending the meeting were:

Carl Beck, president of the Bee Cave Telephone Company, Bee Cave; J. A. McWilliams, Sprinkle Telephone Company, Sprinkle; R. A. Ward, Pflugerville Telephone Company, Pflugerville; John Krebs, president of the Fiskville Telephone Company, Fiskville; R. W. McLendon, manager Dripping Springs Telephone Company, Dripping Springs; Mr. Rutledge, Jollyville Telephone Company; G. T. Howe, president Buda-Kyle Telephone Company, Buda; John Lindholm, president Creedmoor Telephone Company, Creedmoor; S. H. Shutt, district manager United Telephone Company, Temple; R. S. Shelley, general manager South Texas Telephone Company, Austin; E. A. Glass, B. C. Sievers, A. E. Atzfield and J. D. Richardson of the Austin exchange, and W. D. Hart, president United Telephone Company, Austin.

Auditors Ready to Report on Morgan Telephone Properties.

The force of auditors which J. P. Morgan & Company have had at work on the books of the Columbus Citizens, the Dayton Home, the Toledo Home, the Cuyahoga, the United States and other telephone companies in Ohio controlled by the New York financial firm have completed their work and will soon report to the owners.

A complete examination of all the Morgan companies has now been made, in respect to their physical condition as well as their earning capacity and financial situation, and it is expected that within a short time some announcement will be made regarding the future of the companies. The audit is said to show that there is a large earning capacity in all the companies, but that large sums will have to be spent to bring them up to a condition where the best results can be obtained.

The Columbus, the Toledo and the Cleveland companies are in good physical condition and need only financing for extension so that they can go out after business. The Dayton company, as well as the Washington C. H., the London and the subsidiary companies of the United States Telephone Company and also the latter company will require large expenditures to bring them to the proper level of physical excellence.

It is rumored somewhat indefinitely that a new company will be formed which will take over all the Morgan telephone properties in Ohio and that a large bond issue will be made by this company, which will furnish the money to place all the plants in first-class condition. It is expected that some announcement along this line will be made before the first of the year.

Meanwhile, Ohio will continue to look for real Morgan money flowing into the state.

New Equipment for Frankfort, Ky.

The Central Home Telephone Company, of Louisville, recently announced that it proposes to make about $50,000 worth of improvements in new equipment, etc., at the Frankfort plant of the company. According to S. M. Heller, the general manager of the company, located in Louisville, the work of improvement will begin within fifteen days and will require two or three months for its completion.

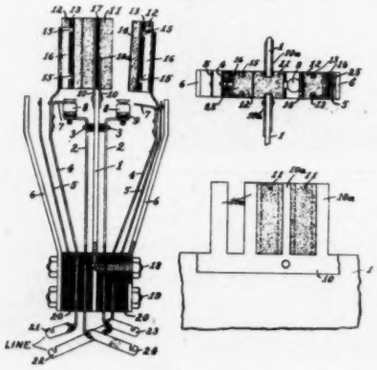
Work of the Inventors

By Max W. Zabel

PROTECTOR APPARATUS.

F. R. Parker, Buffalo, N. Y., pat. 968,395, Aug. 23, 1910.

Means for automatically cleaning lightning arresters are disclosed in this patent and consist of devices whereby the carbons are automatically separated and agitated to remove any carbon dust which may have lodged between them. One



carbon 11, is fixedly mounted and the other carbon 12, is held by a spring 16, having figures 15. Spring 16 is mounted upon a flat leaf spring 4. When the device is in the normal condition, the prong 7 engages the heat coil 8. Upon abnormal increase in the current, the heat coil 8 releases the prong 7 and by virtue of the spring action of the spring 4 allows the parts to violently engage the thick spring 6, agitating the carbon and allowing carbon dust between them to fall away. The dielectric 14 is fastened to one of the carbons. An alarm signal calls the attendant to restore the parts.

INTERCOMMUNICATING SYSTEM.

A. Ekstrom, Stockholm, Sweden, pat. 969,095, Aug. 30, 1910.

A plurality of intercommunicating telephones are arranged for non-interfering service, each station having a telephone and a relay, which is normally inert. When the relay is in its inert condition, its contacts are included in a local closed circuit with a receiver. A source of signaling current is in circuit with the relay and is adapted when connection is made between unengaged stations to energize the relay at the calling station, to thereby break the local circuit and place the telephonic apparatus of the calling station in circuit with the called station.

TELEPHONE SYSTEM.

C. T. Patterson, Albany, Ore., pat. 968,396, Aug. 23, 1910.

This invention is designed to cover the operation of a plurality of telephones without the use of a central station, the arrangement being such that one wire suffices for the operations. At each substation are means to simultaneously break the line circuit and close all the local circuits, or vice versa in combination with a step-by-step mechanism for each of the local circuits. An open local signal circuit is also provided with step-by-step mechanism and is adapted to be closed thereby. Means are also provided to break

the signal circuit and to lock the signal circuit closing means from movement.

REGULATION OF RECEIVER INTENSITY.

R. J. Barber, Belmont, Mass., pat. 968,231, Aug. 23, 1910, assigned to Globe Ear-Phone Co., Boston.

In the telephone receiver illustrated herein, means are provided so that the subscriber when moving the ear piece cannot bring the diaphragm too close to the pole pieces of the magnet. A clamping ring is provided, preventing further inward movement of the ear piece should it be attempted to screw it tighter than the adjustment for which the diaphragm is intended. The diaphragm is held by the ear piece and can be moved away from the pole pieces should the subscriber desire to decrease the intensity of sound.

RECEIVER HOLDER.

J. Hitchcock, Friendly, W. Va., pat. 968,354, Aug. 23, 1910, assigned one-half to O. G. Suter, New Matamoras, O.

A receiver holder for a wall telephone is described in this patent. It consists of a plate mounted over the wall telephone having a long swinging arm to the end of which the receiver is attached. The arm is universally adjustable and extensible to thereby permit of the proper replacement of the receiver upon the switchhook when conversation is ended.

From Factory and Salesroom

High Resistance Measurements by a Direct Reading Instrument.

By Arthur J. Rowland.

The measurement of electrical resistance is one of the most important in electrical engineering, no matter whether it is done in a research laboratory or in connection with tests to determine the efficiency and safety of a line or piece of apparatus. A number of methods are in use; some better adapted to the measurement of low resistance and some to high resistance determination. In all of them, indirect methods are almost invariably employed and yet the advantage of being able to make a reading by direct observation when measuring resistance, is as great as for any other thing capable of being measured. Some of the obvious good reasons in favor of direct methods in taking observations are:

a. The satisfaction in taking a direct reading; no waiting for the result.

b. The speed of reading and of checking results.

c. Anyone can make the readings.

d. Errors are much less likely than by other methods.

The instruments which have been available for directly measuring resistance are ohmmeters which are either electrodynamometers, or those which are voltmeters marked off in ohms.

Fig. 1. The Megger.

The electrodynamometer instruments are built with a fixed coil and a movable coil; the fixed coil being in series with the apparatus whose resistance is to be determined, while the movable coil is connected across its terminals.

The voltmeter instrument must be supplied with a constant voltage, a condition which is practically almost impossible to obtain, and then a given instrument is available over only a very moderate range.

Ten or a dozen years ago, Mr. Sidney Evershed, after much experiment with ohmmeters of a fixed coil type, some of which were made and sold in this country, turned his attention to the development of a portable ohmmeter for high resistance measurements which would have moving coils only and include the valuable features of permanent magnet instruments. Some four years ago the perfected instrument, the Evershed megger, was put on the market. The megger has a dead beat movement and enormously increased sensibility above that of former ohmmeters. It is available in standard instruments in various ranges between 1,000 ohms and 2,000 megohms.

The megger complete and ready for use is illustrated in Fig. 1. This shows the instrument 1-6 of full size. The insulation resistance to be investigated is connected between the binding posts, one of which is marked "line" and the other "earth." The crank turned at a far speed and the amount of insulation resistance in megohms read from the scale. The whole operation requires but a few seconds and can be conducted by anyone. The megger is portable, weighing about 20 lbs., and is self contained. It is said that it is not affected in any way by its surroundings.

In Fig. 3 is shown, diagrammatically, the arrangement of the interior parts. Figs. 2 and 4 show the interior construction and the moving system respectively. Referring to Fig. 3 it is seen that the permanent magnets *M M* are so arranged that a closed magnetic circuit is formed. In this magnetic circuit at one end a pair of pole pieces are placed, between which a dynamo armature revolves. At the other end is another pair of pole pieces,

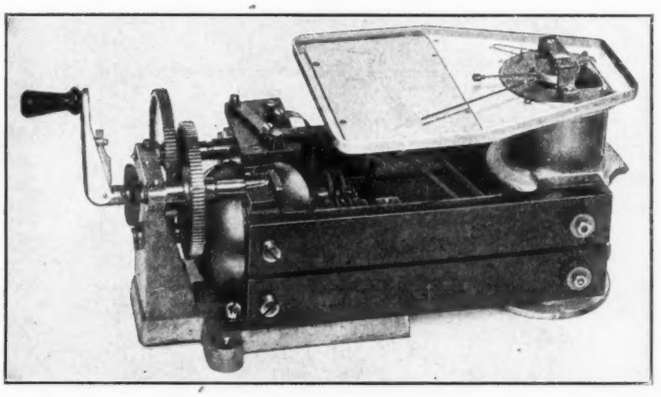


Fig. 2. Interior of the Megger.

within the field of which the moving system works. The dynamo, driven by the crank placed as shown in Fig. 1, furnishes the e. m. f. by means of which the instrument operates. It may supply 100, 250 or 500 volts. Careful designing has brought the torque to be supplied for driving this machine to so small an amount that very little effort is required on the part of the operator.

The moving system is made of three coils rigidly connected to each other; see Figs. 3 and 4. Tracing out the connections, it will be found that the coil *AA* of the moving system is in series with the apparatus under investigation through resistance *R'*. It is the deflecting coil and it exerts a deflecting force in the field where it is placed, proportional to the current in it. Coils *B* and *B'* are connected in series. They, with resistance *R* in series, are put directly across the dynamo terminals and constitute the controlling coil of the instrument, the amount of their restraining force being a function of the position they take.

Reference to Fig. 4 will show how the moving system is assembled. The current is led in and out of the coils through very slender copper ribbons which produce no torque. There are no springs and the needle takes a position determined wholly by the torque of current in a magnetic field.

The proper relation between deflecting and restoring forces is secured through the use of the ↄ shaped iron piece within coil *AA*. It is mounted securely in place on the frame which supports the moving system.

The fact that the megger is an instrument of the moving-coil-permanent-magnet type gives it all the good points which belong to this class, while being an ohmmeter, it is even more constant in calibration. For some purposes the variable e. m. f. derived from the dynamo operating at various speeds is very useful, for cable testing, on account of the capacity present, it is bad. For the latter form of testing, therefore, a constant pressure megger is made. In it a friction clutch is interposed between the last gear and the dynamo armature, so contrived that when operated above slipping speed, the e. m. f. is constant within negligible limits.

Among the many direct applications of insulation resistance measurements one or two may be mentioned. Periodic examination of apparatus for insulation resistance, as is done so readily with a megger, will reveal depreciation whether due to moisture or to the development of some permanent defect. A skilled observer can even tell from the behavior of his

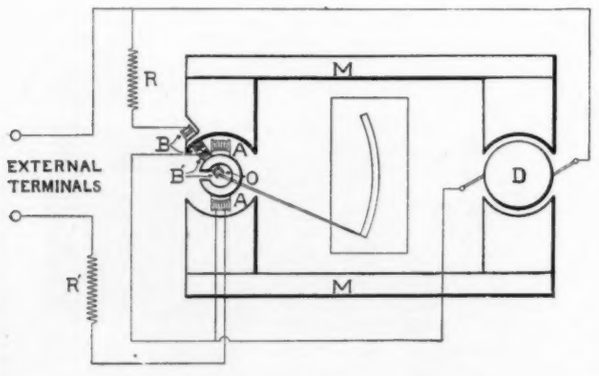


Fig. 3. Diagram of the Instrument.

megger for example, whether the fault is due to moisture or proximity of conductors.

Meggers are also supplied in such form that by throwing a simple switch, the instrument, along with an accessory rheostat, becomes a bridge megger. That is, a megger available for all sorts of Wheatstone bridge work, including Varley loop tests. For the last named purposes, it has some merit in using so considerable an e. m. f. that contact potential differences existing at faults or along lines become nearly or wholly negligible. For general work the bridge rheostat has points of special merit. American users have pronounced it the most rapid rheostat made. Under test by well-known American engineers, the bridge megger when used for measurements between one ohm and a megohm shows a high

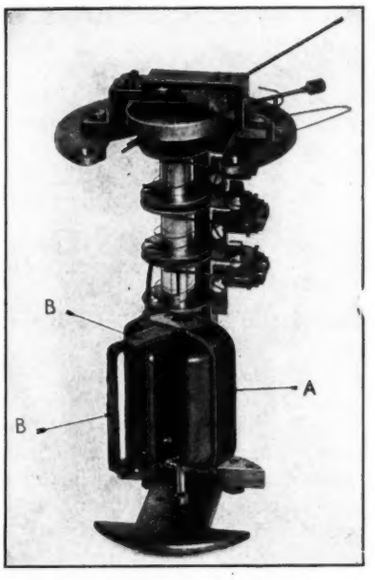


Fig. 4. The Moving Parts.

accuracy. The accuracy of the megger, also, is limited only to the accuracy with which the scale can be read.

Full information regarding this instrument can be obtained of James G. Biddle, sole agent for the United States, at 1114 Chestnut Street, Philadelphia.

The Kellogg Company's New Salesman in Wisconsin.

Mr. R. C. Coyne, of the Kellogg Switchboard & Supply Company, Chicago, is now in charge of the Wisconsin territory. Mr. Coyne has many friends in this section, having traveled the state frequently in the past two years. He is an enthusiastic telephone man with a thorough practical knowledge of the Kellogg line and will devote his entire time to the services of Kellogg customers and friends. His headquarters for the present will be at Delavan.

French Battery Company Branching Out.

The French Battery Co., of Madison, Wis., has enjoyed a very prosperous year, and continues to enlarge and extend its business. Two branches, in charge of first-class men, have recently been established as follows: Portland, Ore., 200½ Washington St., Mr. J. J. McNerney, manager; Kansas City, Mo., 1613 13th St., Mr. K. J. Helmholtz, manager. The headquarters at Madison also enjoys increased facilities by reason of the offices having been moved into the new Washington Block, so that the entire factory building is now given over to manufacturing.

The Reorganized Ericsson Company.

There is a new-old friend in the game. That is, an old friend with a new name. The old friend was the L. M. Ericsson Telephone Manufacturing Company, of Buffalo, N. Y., famous for hand-microphones and steel telephones. The new name is the Ericsson Manufacturing Company, famous for the same old things and a lot of new ones—at least its reputation is expected to be enhanced on account of the new ones.

There are new faces in the old place as well as the new name, as TELEPHONY's representative can testify. He found that

the new and the old working together and had not only made improvements and many additions to the line of apparatus, but to the plant and facilities as well.

The new faces were not new to the telephone game by any means, but, on the contrary, one visiting the plant now is struck by the fact that he seems to be surrounded by old friends, and the old friends seem to have been blended together by the cheerful warmth of "The Melting Pot" into a very happy family. Many people believe in large, happy, united families, and on this basis we believe in Ericsson.

The first old familiar face our scribe bumped into was H. H. Ide, superintendent. He didn't have much to say himself about what he was accomplishing, but from other sources it was learned "on good authority" that his engineering experience, together with his manufacturing experience have enabled him to do some rather novel little stunts, both in manufacturing and in the development of Ericsson apparatus. Ide is a Purdue man—says he got through because "Prof." was a good fellow.

The next old friend turned out to be Frederick R. Parker, patent attorney, inventor, engineer and developer general. Parker has had lots of experience in various branches of the telephone art and ought to help the Ericsson people make many friends. He says he has 287 separate and distinct patents, more or less, on telephones, switchboard circuits, etc. Parker graduated from Purdue a good many years ago and from talk we have heard in the telephone field we rather assume that most good telephone men have at one time or other been to Purdue. Of course, as the daily papers say, this is only "alleged."

One did not have to look far to discover a third familiar face, H. A. Shepard, purchasing agent—erstwhile in the same department at Kellogg. "Shep" says there's only one man he would rather see in the office than a salesman and that is a customer.

The last new-old face was Frank W. Pardee. Everybody knows Frank, and his life history, which appeared in these columns recently, told his old friends where to find him. Sure enough, here he was, with something less than 200 lbs. of avoirdupois, holding down the position of vice-president and general manager.

There were several faces, old to both Ericsson and the telephone trade—Thomas S. Hemenway, treasurer of the company, who also does engineering stunts and other theoretical and practical ground and lofty tumbling; and H. R. Dilks, also in the engineering department and Chief Something-or-Other in addition.

P. S.—Oh, yes; we nearly forgot to mention that they are also Purdue products, both.

Altogether, it seems like a mixture of old times and new times to go into the Ericsson plant, and old and new ought to succeed in their very evident desire to make new friends for the Ericsson company and Ericsson apparatus. They hope that the new and abbreviated name, Ericsson Manufacturing Company, will appeal to every man who has to write out orders.

Frank Pardee tells us that the company has more than doubled its capital stock, and that, naturally, this means greater expansion and greater strides in development and in additions to the present line.

The New Officers of the Chase Motor Truck Company.

At the meeting of the stockholders of the Chase Motor Truck Company, Syracuse, N. Y., the following were elected for the ensuing year: A. M. Chase, A. C. Chase, H. P. Bellinger, all of Syracuse; L. O. Bucklin, Little Falls, and Geo. A. Brockway, Homer.

At a meeting of the directors immediately following the stockholders' meeting, the following officers were elected: A. M. Chase, president; H. P. Bellinger, vice president; E. A. Kingsbury, secretary-treasurer.

Substantial Indication of Growth.

That the Independent telephone companies have enjoyed a successful season and continue to increase and prosper is evidenced by the fact that pole dealers have enjoyed more trade with this class of companies during the current season than for some time past. Mr. L. L. Hill, secretary of Page & Hill Company, Minneapolis, mentions incidentally in a recent letter that in April, May and June of this year they shipped more poles than ever before in the corresponding months. As their pole trade is almost exclusively with the Independents, this would indicate that the Bell competition has enjoyed a lively growth, notwithstanding all of the loud and continuous talk that the Bell makes every time it puts through a little consolidation deal.

New Key Equipment for Celina, Ohio, Switchboard.

The Celina Telephone Company, of Celina, Ohio, has recently placed new key shelves on its switchboard. This was to enable it to install the bridged and series clearing-out drops of the Monarch Telephone Manufacturing Company, of Chicago. While it is not necessary under ordinary conditions to replace the key shelves when installing this system, the Celina company did so, owing to the worn condition of the old shelves. Since the installation of this system there has been a marked improvement in the service, there being no delays on account of the clearing-out drops failing to operate.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., in a pamphlet just issued, describes its No. 5597 P. B. X. switchboards. Views of the board opened both in back and front are shown. The company reports that it will carry these boards in stock at Rochester, packed ready for shipment on telegraphic order. On the inside of the folder are addressed "Night letter" telegraph blanks for both Postal and Western Union companies, with explanation as to use in ordering a switchboard.

Julius Andrae & Sons Company, Milwaukee, Wisconsin, has issued a souvenir booklet describing the organization of the company and the growth of the business, the occasion being the company's semi-centennial anniversary. The growth of the organization from the pioneer beginnings to its present important stage is traced in the booklet. It is a model of printers' and engravers' most excellent workmanship, and the information it contains is of interest to all who have heard of this progressive firm.

American Electric Fuse Company, Muskegon, Mich., has issued Bulletin No. 316 on the Allen-Bradley battery charging rheostats. The rheostats are fully described and the various types illustrated. A table is given showing the maximum charging rate in amperes for which the rheostats are designed with various sized batteries.

Mr. H. D. Currier, until recently connected with the New York office of the Duplex Metals Company, was, on September 1st, transferred to Chicago, where he is in charge of the firm's wire business in the Western territory. The company's Chicago offices are on the eighth floor of the Monadnock Block.

Mohawk Electrical Supply Company, 329 South Warren St., Syracuse, N. Y., has issued booklet No. 2, which continues a talk in general about the stock and business of the firm. It carries a full line of construction tools, complete stock of pole line hardware, and equipment supplies, telephones and supplies, and in fact everything used in electrical work.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. ALFRED SLATER, manager of the Beloit Home Telephone Company of Beloit, Wis., has resigned that position.

MR. H. T. DAVIS, of Plattsmouth, has been elected general manager of the Home Telephone Company, of Papillion, Neb.

MR. JAMES E. MORROW has been appointed manager of the Home Telephone Company, of Owensboro, Ky., succeeding H. C. Jones, the former manager, resigned.

MR. C. H. STEMPEL, of the contract department of the Iowa Telephone Company, has been appointed manager of the Fort Madison exchange to succeed Mr. M. H. Driftmier.

MR. L. E. MASON, for some time general manager of the Bell telephone exchange at Lawrence, Kans., has been made district traffic chief of the company with headquarters in Wichita.

GEORGE K. BLAKELEY, district commercial manager of the Northwestern Telephone Company, and Miss Paula Pope, chief operator for the same company, Sioux Falls, S. D., were married on August 24.

MR. M. H. DRIFTMIER, for some time manager of the Fort Madison, Iowa, exchange of the Iowa Telephone Company, has been made toll manager of the northeastern Iowa division of the same company.

MR. GEORGE J. YUNDT, chief engineer of the Southern Bell Telephone & Telegraph Company, sailed for Europe August 31 on the Cunard liner Mauretania. He expects to put in two months of sightseeing in England and on the Continent.

MR. OSCAR QUALE, of the maintenance department of the Wisconsin Telephone Company at Milwaukee, has been transferred to Baraboo, Wis., as manager of the exchange there and at North Freedom.

T. H. BEESON, who has been connected with the Alliance Telephone Company, Alliance, Mich., for some time as assistant manager, has been promoted by the officials of the company to the position of manager.

OBITUARY.

MR. G. A. WINTERMUTE, traveling auditor of the Southern Bell Telephone and Telegraph Company, died of typhoid fever in Atlanta, Ga., on the night of August 20th. Mr. Wintermute was with the auditing department of the Southern Bell company for a number of years, and it was while he was engaged on an audit at the company's headquarters that he contracted the disease which afterward caused his death.

In the capacity of traveling auditor he became well known throughout the company's territory. Mr. Wintermute was a young man of exceptional ability, with a bright future before him, and the unexpected news of his death came as a severe shock to his many friends.

NEW COMPANIES.

MAXWELL, IND.—The Maxwell Telephone Company has been chartered, with a capital of $625. John H. Mugg, T. A. Leaman, R. A. Alben, Geo. B. McClarnon and T. R. Shinley are the incorporators.

WABASH, IND.—Among the incorporations filed with the secretary of state is that of the Lagro-Andrews Telephone Company of Wabash, with a capital stock of $26,000, and William O. Taylor and Daniel A. Taylor as the incorporators. The names are those of the present owners of the Andrews and Lagro exchanges, and it is presumed that the idea is to consolidate the two business, which have for some time been run jointly.

SANDSTONE, MINN. (Pine Co.)—The Clover Belt Telephone Company, with an authorized capital stock of $50,000, par value of shares $100, has been incorporated by J. M. Ingraham, Hugo Wickstrom, Matt. Bullis, J. F. Hawley, H. P. Webb, Geo. Meader and Edw. Armstrong, all of Sandstone.

ALBANY, N. Y.—The Marquis Telephone and Telegraph Company, organized by J. B. Marquis, J. J. Ray, J. O. H. Reed, of Norwich, N. Y. has been incorporated with a capital stock of $100,000.

FENTON, N. Y.—E. W. Neff, Port Crane; E. E. Mawrey, Chenango Forks; Alvah Sheperdson, Port Crane; Harvey Grippin, Port Crane; Charles Tracy, Port Crane; J. D. Engle, Chenango Forks, and Oliver W. Hatch, Chenongo Forks, directors, are the incorporators of the Fenton Telephone Company, chartered with a $500 capital.

SYRACUSE, N. Y.—The Alleghany County Telephone Company has been incorporated with a capital of $200,000. Incorporators are: Clarence Ricker, Belmont, N. Y.; H. Frederick Stevens, Bert H. Shepard, both of Syracuse, N. Y., and eight others.

RALEIGH, N. C.—A charter is issued by the secretary of state to the Tri-County Public Service Company of Asheville; capital $25,000. R. S. Howland, William Pharr and Chas. I. Lee are the incorporators.

LIVINGSTON, TENN.—A charter has been granted the Home Telephone Company. The capital stock is $1,500, and it is proposed to build a line from Livingston to Byrdstown The incorporators are John Lacy, J. J. Parris, S. C. Huddleston, Jesse Franklin and S. M. Turner.

SPARTA, TENN.—The Home Telephone Company has perfected organization with the following officers: Sam Johnson, president; C. W. Roberts, vice-president; J. L. James, secretary and treasurer, and Sid Alcorn, N. Hatfield, Walter Holladay, Newton Clouse ,and J. D. Steward, directors. The company already has a franchise and is now putting in its plant.

AUSTIN, TEX.—A permit has been granted the Grayson Telephone Company, of Phoenix, Ariz., to do business in Texas. The principal office will be in Sherman. The capital is authorized at $250,000.

GORRIE, ONT., CAN.—The Howick Telephone Company, capital $7,000, has been incorporated here by Messrs. Richard Carson, Charles L. Andrews and Robert H. Stephens, merchants.

ROSENEATH, ONT.—The Alnwick Rural Telephone Company, Limited, has been formed here. Capital, $3,700. Incorporators are Dr. Edgar W. Hadyn and Frederick A. Aylesworth, Alnwick, Ont.

FINANCIAL.

LAWRENCEVILLE, ILL.—The Citizens' Telephone Company has increased its capital stock from $40,000 to $80,000.

SAVANNAH, MO.—The directors of the Mutual Telephone Company at their meeting will take up the proposition to increase the capital stock from $15,000 to $20,000.

OMAHA, NEBR.—The Independent Telephone Company, of Omaha, has applied to the state railway commission for leave to extend its schedule of rates to South Omaha, Florence and other suburbs of Omaha. The company received authority two years ago to publish a schedule applicable to Omaha, graded according to the number of subscribers, the minimum rate being $2 per month. When the company begun to give similar rates to South Omaha and Florence the railway commission called the company's attention to the fact that the order of the commission applied only to Omaha. The company now asks leave to extend the Omaha rates to suburban towns.

BOSTON, N. Y.—The Boston Valley Telephone Company has certified to the Secretary of State that at a meeting of the stockholders they voted to increase the capital stock from 200 shares at $10 each to 400 shares at $10 each.

FRANCHISES.

DOLGEVILLE, N. Y.—The Glen Telephone Company has been granted a franchise to construct and maintain a telephone system.

CONSTRUCTION.

CLINTON, ILL.—The National Telephone and Electric Company is making preparations to build 40 miles of toll line, adding to its extensive system.

GALESBURG, ILL.—The Galesburg Union Telephone Company is rebuilding its system in Knoxville.

MT. PULASKI, ILL.—The Mt. Pulaski Telephone Company is constructing lines in all directions from the central exchange to take in rural subscribers living in the surrounding territory.

ST. JOSEPH, ILL.—The St. Joseph Telephone Company has put up a cable which reaches from the exchange office to the north side of Warren street. The cable holds 200 wires and will be a great benefit not only to the company, but the patrons of the exchange as well.

STROH, IND.—The Farmers Telephone Company is installing a line between Stroh and Brushy Prairie. This line is to be for the use of merchants and business men, exclusively.

SWAZEE, IND.—The Swazee Telephone Company at a recent directors' meeting voted to purchase a new switchboard. The present switchboard is full and there are demands for a number of additional lines which cannot be taken care of with the present equipment.

JUNCTION CITY, KANS.—The Wareham-Dewey Telephone Company, which for the past two months has been at work with a force of men getting its lines in shape, has completed the work. The company has extended its lines in every direction over the city, and a new section has been added to the switchboard, making room for over 100 new telephones.

MULVANE, KANS.—The Mulvane Telephone Company will commence work at once on its new exchange building. It will be 25 by 25, of pressed brick. A large new switchboard of the very latest pattern is to be installed and a complete rebuilding

of lines, using underground and overhead cables, will be undertaken.

TOPEKA, KANS.—The Topeka Independent Telephone Company is enlarging the capacity of its plant by increasing the switchboard capacity and installing underground conduits and cables. Two carloads of cable have been installed and an underground conduit is being put in from the corner of Fourth and Railroad streets to Oakland. The aerial cables now extending to Oakland will be taken down.

LONDON, KY.—The London Telephone Company is planning to erect a telephone line from London to Barboursville, a distance of 35 miles; connections will be made with Lily and McWhorter. The local lines in London are to be overhauled.

RITCHIE, KY.—Preparations are being made by Henry Callahan and others for the erection of a telephone line from Ritchie and Hazard to connect with the system in Hazard. A local system will also be constructed in Ritchie.

ANNISTON, MO.—The recently organized Anniston Farm Telephone Company is building a telephone exchange in this place. It expects to connect with about 100 town and rural subscribers. H. E. Babb is manager.

HOLCOMB, MO.—The Holcomb Telephone Company has completed the construction of its exchange and is giving service to about sixty subscribers. Dr. J. A. Hogue is president of the company.

BUTTE, MONT.—In the purchase of the Big Blackfoot Telephone Company by the Montana Independent Telephone Company, as announced by President T. S. Lane, the company has acquired an extension of more than 50 miles to its system. The Big Blackfoot Telephone Company, of which C. A. Jakways of Ovando was president, extends from Drummond to Ovando and Helmville and traverses a section through which the proposed new Milwaukee extension from Missoula to Great Falls is to be built. The newly completed long distance lines of the Montana Independent Telephone Company between Butte and Missoula will furnish a connection for the Big Blackfoot company and will be of especial value to the Independent telephone subscribers at Missoula and Deer Lodge. A carload of wire has been ordered shipped to Drummond and the rehabilitation of the property will be begun at once. The capacity of the plant will be doubled.

CHIHUAHUA, MEXICO.—The Chihuahua Telephone Company has purchased a lot, and as soon as plans and specifications are completed a two-story, modern telephone exchange will be erected. It is reported that about $60,000 will be expended immediately in improving the system. The switchboard has been filled to its capacity for some time.

SARGENT, NEB.—The Crownover Telephone Company recently completed a metallic toll line from Sargent to Ord, a distance of 30 miles, and 12 miles of metallic toll line from Sargent to Comstock, to Ash Center, 16 miles, and to West Union, six miles, a total of 64 miles. This company is a member of the Independent Telephone System of Nebraska.

ASHEVILLE, N. C.—The Tri-County Public Service Company has secured its charter and will commence construction work soon. It is the expectation of the incorporators to combine the telephone lines of North Buncombe, Yancey and Madson counties and to supply the towns and villages along the route with power and telephone service. One of the plans is to build a telephone line from Weaverville through Yancey County to Burnsville, thus connecting Asheville with the latter place. A consolidation of the Weaverville line, the North Buncombe line and others is probable.

WILLIAMSBURG, OHIO.—The Williamsburg Home Telephone Company has placed an order for a new switchboard, and considerable cable work is to be installed at once. The company operates about 800 telephones in Clarmont county.

GLEN ROCK, PA.—The Glen Rock-New Freedom Telephone Company is building a line through Glen Rock to Brodbeck's, which when completed will give its patrons a direct line of service to this point.

FORT WORTH, TEX.—Approximately $150,000 to $200,000 will be spent by the Fort Worth Telephone Company within the next year in either rebuilding their entire plant at Fort Worth, or in adding to the present equipment and facilities.

FRANKLIN, TEX.—The Franklin Telephone Exchange Company is making extensive improvements in its local telephone service. Old poles are being taken down and large new ones erected in their places. A new and more commodious switchboard is to be put in and the service generally improved.

WOODLAND, WASH.—The Hayes-Etna Telephone Company, newly organized, is building a line from Woodland to Hayes and Etna, along the Lewis river. The poles have all been set, and a considerable amount of the cable is strung. The line is 70 miles long. About 50 subscribers have been secured to date.

MENOMINEE, WIS.—The Tri-State Telephone Company is setting poles preparatory to instituting long-distance service. Mr. D. S. Neill, of Red Wing, Minn., is in charge of the work. The company does a large business at the Twin Cities, Red Wing and other points, and promises to develop an extensive toll system. A local exchange will be established at the Hotel Royal.

BLACKWATER, CAN.—The Fort George and Alberta Telephone Company's new line from Blackwater, where connection is had with the government system of telegraphs, to Fort George, a distance of 55 miles, was recently completed and is said to be one of the best paying services in British Columbia.

MISCELLANEOUS.

DELAND, FLA.—The Deland Telephone Company, through arrangements made with the Government, will, it is reported, give daily weather bureau service to the towns of Lake Helen, Orange City, Beresford and Glenwood.

FINDLAY, ILL.—A movement is in progress toward the merging of the Farmers' Mutual Telephone Company and the Melcher Telephone Company, both of Findlay.

PONTIAC, ILL.—Mac. A. Rittenhouse of Detroit, and W. A. Brewster, of Pontiac, are interested in the promotion of the Pontiac Telephone Company. An ordinance was introduced into the council providing for a franchise.

CASSOPOLIS, IND.—Representatives of the Cass County Telephone Company, located here, were at Edwardsburg proposing negotiations for the purchase of the Olds Telephone Company, which operates 200 telephones about Eagle Lake, and of which M. O. Olds is owner.

CROWN POINT, IND.—The Northwestern Telephone Company, an Independent company, has secured permission, after three years, to build an exchange system in this city. William Coy is the president of the company and Henry Batterman, of Dyer, is one of the officers. The company has built many new lines, according to President Coy, and it is expected that the work of extension will be greatly facilitated now that headquarters have been opened in Crown Point.

WEST LEBANON, IND.—The Farmers Telephone Company has purchased the Williamsport Telephone Exchange.

KEARNEY, NEBR.—The Kearney Telephone Company is extending its country lines in various directions from the city.

ALBANY, N. Y.—Certificates of merger of six telephone companies in the state of New York have been filed with the Secretary of State. They are: East Springfield Telephone Company with Otsego and Delaware Telephone Company, the Cuba Telephone Company with Allegany County Telephone Company, the Bolivar Telephone Company with Allegany County Telephone Company, Belmont Citizens' Telephone Company with Allegany County Telephone Company, the Belfast Telephone Company with Allegany County Telephone Company and the Angelica Telephone Company with the Allegany County Telephone Company. Ownership in each case was acquired by purchase of the capital stock.

GALLAPOLIS, OHIO.—Receiver Cyrus Huling, of the Gallapolis Telephone Company, has secured an order of sale from the Common Pleas Court for September 27. All the property of the company, which is appraised at about $21,000, will be offered for sale at that time.

WEST UNION, OHIO.—Judge Blair appointed C. E. Robuck, an attorney of West Union, as receiver for the Blue Creek Telephone Company, which has principal place of doing business at Blue Creek, in Adams County, Ohio.

BUTLER, PA.—At the annual meeting of the stockholders of the People's Telephone Company reports were received from the construction superintendents and auditors. During the past twelve months the gain in new telephones placed in residences and business houses has averaged over 100 a month. The old board of directors were re-elected, as follows—A. L. Reiber, T. J. Shufflin, J. V. Ritts, J. H. Troutman and T. M. Baker.

TEMPLE, TEX.—D. C. McGowan, of Belton, associated with D. R. Walton, is seeking to interest local business men in the building of a long distance telephone line that is intended to follow the line of the Temple-Northwestern Railroad.

HIGGINS, TEX.—The telephone line running south of town has been sold by the Canadian Long Distance Telephone Company to a local company of the users of the line and will be known as the Littlerobe Telephone Company.

JANESVILLE, WIS.—The First Baptist Church of Clinton is the first Wisconsin church to make telephonic arrangements for the transmission of sermons to the "shut ins" who, by reason of sickness, weather or other causes are unable to attend service. The Clinton Telephone Company has arranged to install a powerful transmitter at the church pulpit.

KENOSHA, WIS.—About 300 telephones of the Kenosha Home Telephone Company were put out of commission in a recent electrical storm. What seemed to be a large ball of fire, and thought by some to have been a meteor, whirled through the air and finally struck a telephone wire. An explosion and shower of fire followed the striking. The wire near where the ball struck, it is reported, was covered with a fine black powder.

UNDERGROUND.

SPRINGFIELD, OHIO.—Wire using companies in this city, including the Bell Telephone, Western Union telegraph, and Postal telegraph companies, are planning on placing wires underground. According to reports, the companies plan to lay several underground conduits this season to take care of the central district. All of the Western Union wires leading from the local office and around to the Big Four passenger station are to be placed in conduits. This is to be carried out at once. Later on a trunk system of underground wires is to be constructed from the western part of the city to the eastern section. The electric light company is expected to join with the others in an underground conduit plan. Under its franchise it is required to lay a certain number of squares of conduits each year after three years from the time its franchise was granted.

In the Rural Line Districts

The Farmers' Telephone Co. finished their clear line to Minneapolis last Wednesday.—*Glendale Glimpses in the Minneapolis (Kansas) Better Way.*

Miss Mina Rygaard, chief operator for the new telephone company, lives next door to this reporter. Occasionally she comes over to our house to use the old phone, and talks in a whisper. Don't you bawl in a telephone? It isn't necessary. Telephone experts never do.—*Atchison (Kansas) Globe.*

Jule Guillod, of the Triplett telephone company, was in Whitham Tuesday and installed a phone in the residence occupied by G. E. Smith.—*Keytesville (Mo.) Recorder.*

Jesse Miller has taken a position with the Missouri-Kansas telephone company at Kansas City and will also study music while living in that city.—*Anthony (Kansas) Bulletin.*

Julius Burkhardt, secretary and manager of the Mutual Telephone Co. was up from Decatur, owing to sickness of Glen Jenkins the local man, installing new 'phones in the city, one day during the past week. He reports business good and the line growing all the time. They are working for direct line to Bentonville and co-operating with Watson's line at Gentry, in a line to Maysville from Gravette.—*Gravett (Ark.) News-Herald.*

Raymond Erhard passed the examination for 'phone operator on the Santa Fe Monday, and began work at Wright Tuesday.—*Dodge City (Kansas) Journal.*

W. T. Scott was here Friday on business with the telephone company. He is trying to form a separate line out of No. 3 and No. 6, each having them so weak that good service is not available.—*Russellville (Mo.) Rustler.*

Manager Shannon of the Mound City Telephone Co., has been busy this week putting up more cable and otherwise improving the already excellent system now installed.—*Mound City (Kansas) Republic.*

One day this week lightning run into the mill building at Pioneer, on a telephone wire, and set a window curtain on fire, burning it in twain, and a portion of the curtain fell to the floor, still afire, on a pile of paper, and only its timely discovery, prevented a fire.—*Monett (Mo.) Times.*

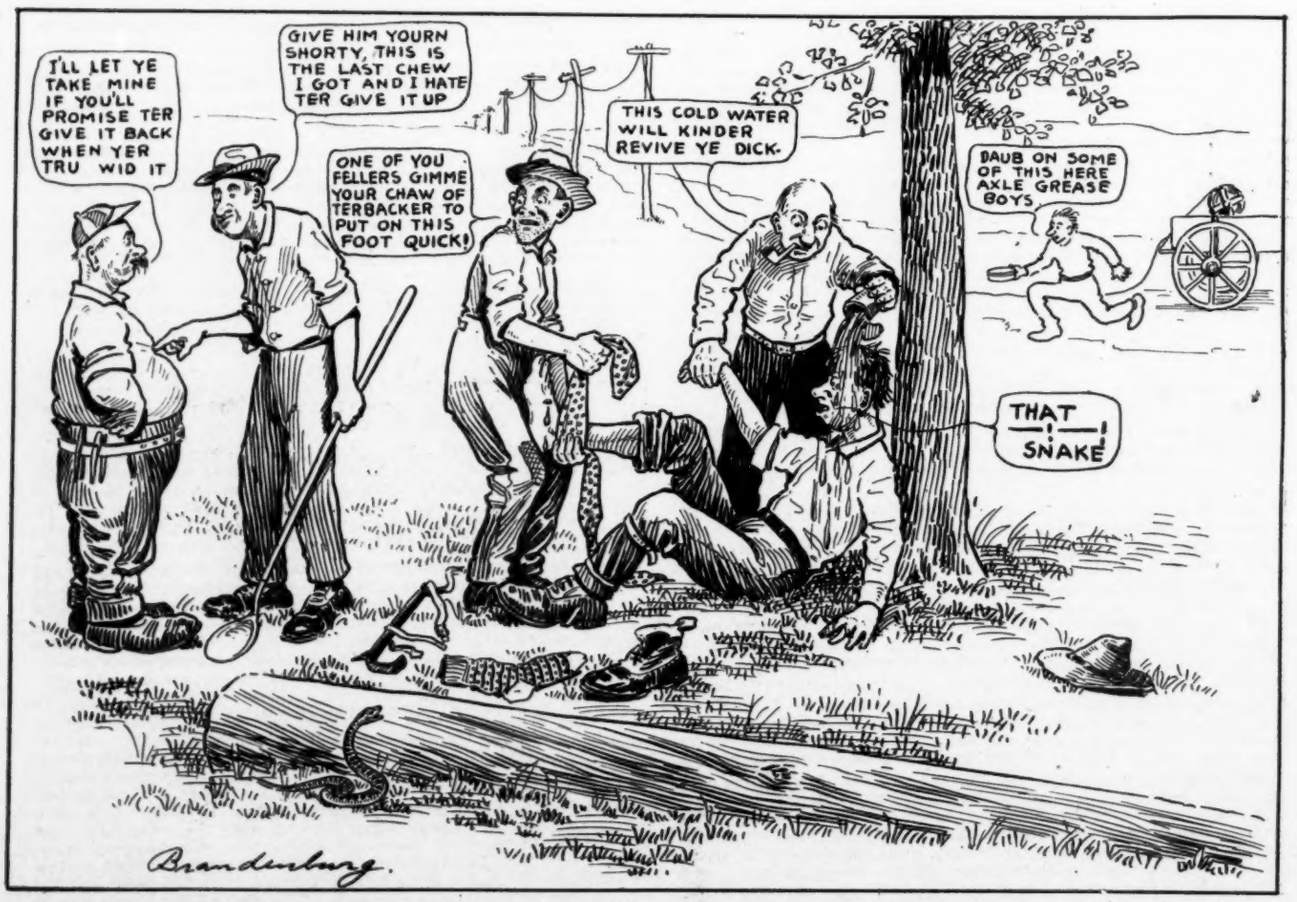
Miss Pearl Stanfield has resigned her position as central girl for the Independent Telephone Company.

Miss Stanfield is the oldest central girl in the office, having worked steadily for the past eight years. She expects to spend the summer in Colorado, and upon her return will take up a position with her brothers, who have recently purchased Dawson's book store.—*Belleville (Kansas) Telescope.*

Wyatt Wilkin has gone to Canadian, Texas, on telephone business.—*Burlington O. News in Lyndon (Kansas) Herald.*

C. H. Munsell, president of the Hamilton Telephone Company, came in from Excelsior Springs Wednesday morning and will spend a few days here looking after the interests of the company.—*Hamilton (Mo.) Advocate.*

E. B. Marmaduke, of Hannibal, was in the city, on business connected with the telephone company, the first of the week.—*Palmyra (Mo.) Spectator.*


I'LL LET YE TAKE MINE IF YOU'LL PROMISE TER GIVE IT BACK WHEN YER TRU WID IT
GIVE HIM YOURN SHORTY, THIS IS THE LAST CHEW I GOT AND I HATE TER GIVE IT UP
ONE OF YOU FELLERS GIMME YOUR CHAW OF TERBACKER TO PUT ON THIS FOOT QUICK!
THIS COLD WATER WILL KINDER REVIVE YE DICK.
DAUB ON SOME OF THIS HERE AXLE GREASE BOYS
THAT SNAKE
Brandenburg.

Dick Moore, of the Bell Telephone line force was trying to stamp a snake to death yesterday while he had his climbers on, and missing the snake one of the gaffs sank to the bone in his right foot, the prompt application of a large chew of tobacco as a poultice allowed the lineman to proceed with his work.—*Pittsburg (Kansas) Headlight.*